DOCUMENT RESUME

ED 342 450 JC 920 132

TITLE	Preparing Michigan Students for the Jobs of Tomorrow: The Report of the Tech Prep Task Force.
INSTITUTION	Michigan State Board of Education, Lansing.
PUB DATE	May 91
NOTE	73p.
PUB TYPE	Guides - Non-Classroom Use (055) -- Reports - General (140)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	*Articulation (Education); Career Counseling; *College School Cooperation; Community Colleges; Curriculum Development; Educational Cooperation; Education Work Relationship; High Schools; *Job Training; Statewide Planning; *Technical Education; Trade and Industrial Education; Two Year Colleges; Vocational Education
IDENTIFIERS	*Michigan; *Tech Prep

ABSTRACT

Both secondary schools and community colleges are under pressure to increase the technical content of their curricula to produce graduates who can fill highly skilled technician jobs in a changing work force. Technical Preparation (Tech Prep) Programs are partnerships between these two institutional levels that incorporate career counseling and curricular cooperation. In Michigan, a statewide task force was charged with developing models for the Tech Prep concept in the state. The task force identified three essential components for each Tech Prep program (i.e., leadership, guidance/counseling, and curriculum) and recommended a level of state support necessary to implement successful programs. The leadership component involves institutional decision makers, business and industry, coordinators for each high school/community college partnership, and partnerships to ensure that high school completion students have access to Tech Prep. The key elements of guidance and counseling for Tech Prep include student selection, career awareness/exploration, self-awareness, career planning, student assessment and placement, and education/employability development plans (EDP) beginning in high school which will lead to a technical career. The curricular component focuses on the following competencies: abstract thinking skills, social and work skills, technical literacy, and technology education. To implement Tech Prep in Michigan, state support will be needed in public relations, evaluation, technical assistance and the development of demonstration programs. Appendixes include examples of an EDP, Technical Preparation Competency requirements, organizational structures, three established partnership programs, the minutes of Task Force general meetings, and a 54-item bibliography. (JSP)

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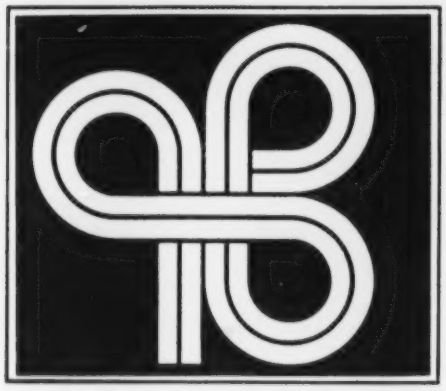

TECH PREP
PARTNERSHIPS

Preparing Michigan Students for the Jobs of Tomorrow.

The Report of the Tech Prep Task Force

A Michigan State Board of Education Project

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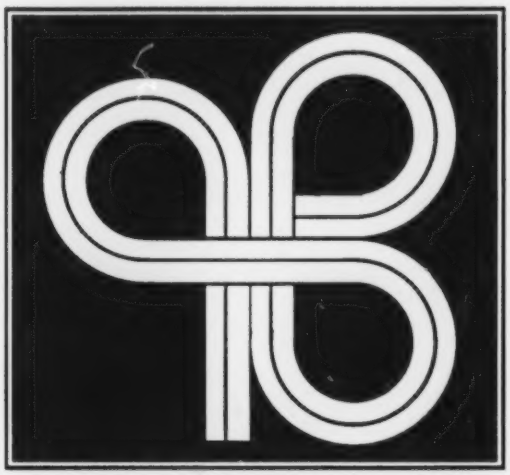

TECH PREP PARTNERSHIPS

Submitted to:

Michigan State Board of Education

Prepared by:

Tech Prep Task Force

First Printing, May 1988
Second Printing, July 1988
Third Printing, May 1991

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TECH PREP PARTNERSHIP

EXECUTIVE SUMMARY

MAY 1988

Both secondary education and community colleges are under pressure to increase the technical content of their curriculum to provide graduates who can fill the highly skilled technician jobs in our changing workforce. The skill levels required of the workforce are so demanding that they cannot be addressed by the high school or the community college alone; there must be a concerted effort at both levels. Our country needs better prepared workers to fill the technical jobs to keep America working. As Dr. Dale Parnell says, "these current and future technicians will keep our planes flying, our water flowing, our electricity charging, our hospitals operating, our computers clicking, our cars running, our laws enforced and our goods and services sold."[1]

From 1979 to 1985, the State of Michigan experienced a 21% drop in industrial jobs, losing 234,000 jobs and 500 manufacturing businesses.[2] In the future, manufacturing will account for only 17% of all jobs. Even these jobs will require new technical skills. Fully 52% of new jobs will require one or more years of college.[3] The old jobs requiring little education are decreasing. The new manufacturing floor is increasingly automated; design and drafting work are based on Computer-Aided Design. Consider, for instance, the changes in the field of nursing. According to a recent study of 79 hospitals in Michigan, over 70% of the nurses are using computers.[4] Couple this with the doubling of medical information every two to three years, and the need for a technically proficient and lifelong learner becomes essential.

The Technical Preparation Program is a partnership between the two institutional levels that addresses the career counseling and curriculum cooperation necessary to produce master technicians. With a strong counseling component in the 8th and 9th grades, the intent of Tech Prep is to encourage technology education for all students. In particular, the program seeks to challenge "general education track" students, whom Parnell says "see no connectedness, no aim, no purpose to their education, often seeing no point in continuing in school."[5]

The characteristics of Tech Prep Programs are the following:

- Develop partnerships between secondary districts and community colleges.
- Initiate students into Tech Prep in secondary schools.
- Offer early awareness of technical careers.
- Benefit students with better career counseling for academic success and future employment.
- Prepare students with broad technical competence in high school for specialization at the Associate Degree level.
- Coordinate high school vocational education programs with technical occupational programs at community colleges.
- Provide Associate Degree graduates with higher level technical skills.

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[1] Dale Parnell, *The Neglected Majority*, Wash. D.C.: AACJC, 1985.

[2] Paul Pearson, Ph.D., *The Future of Work and Education: Collaboration for Survival*. Grand Rapids, MI. 1987.

[3] *Countdown 2000: Michigan's Action Plan for a Competitive Workforce*, Prepared by: State of Michigan, Governor's Cabinet Council on Human Investment and the Adult Literacy Task Force, March, 1988.

[4] Michigan Community College Consortium Report, *Computers in Nursing*, 1987.

[5] Parnell, *The Neglected Majority*.

TECH PREP TASK FORCE FINDINGS

A statewide Tech Prep Task Force was charged with the development of models for the Tech Prep concept including "identification of previous research, competencies, guidance and academic components, and recommended delivery systems." This 23 member Task Force included administrators, counselors and teachers from high schools and community colleges.

At the conclusion of the first six month period of meetings, the Task Force agreed upon 1) a definition of Tech Prep Programs, 2) general competencies, and 3) recommendations. After several definitions were proposed, the majority of the Task Force members accepted the following:

> *Tech Prep Associate Degree programs are community-wide partnerships among school districts, community colleges, and business/labor to prepare youth and adults for entry into technical career fields.*

The following recommendations set the framework for proposed Technical Preparation Programs. The Task Force identified three essential components for each partnership program as well as the necessary support from the State to implement successful programs. These components are leadership, guidance/ counseling and curriculum.

LEADERSHIP:

Institutional decision makers form partnerships which:

- Involve top level decision makers.
- Select program areas that involve business and industry.
- Identify a coordinator for each high school/community college partnership program.
- Ensure that students in adult education high school completion programs have access to Technical Preparation Programs.

GUIDANCE & COUNSELING:

- Include the following key elements of career guidance and counseling in each Technical Preparation Program:

  a. Student selection into Tech Prep
  b. Career awareness, exploration and self-awareness
  c. Career planning
  d. Student assessment and placement
  e. Education/Employability Development Plan

- Develop computerized Educational Development Plans (EDP) for each student and up-date annually.
- Involve parents in the guidance process.
- Provide special guidance programs to adults enrolled in adult education high school completion programs.
- Use business/industry for input into guidance plan.

CURRICULUM:

- Establish a curriculum team of four levels: an advisory committee, a management team, a planning/ design team and an implementation team.

- Include a Technical Core Curriculum based on essential technical competencies as follows:

  a. Abstract thinking skills: These include reasoning, problem-solving and decision-making. These skills should be developed in all courses, but especially in mathematics, English, science and vocational/technical courses which are a part of the technical preparation program.
  b. Social and work skills: These include experiences and behavioral expectations such as interpersonal skills, adaptability, accountability, employability, entrepreneurship and work ethics.
  c. Technical Literacy: This includes computer literacy as a minimum as well as other technical skills relevant to the specific program.
  d. Technology Education: An organization of subject matter which provides opportunities for experiences concerned with developing insights into technology; its evolution, utilization, systems and significance, and its social and cultural impact.

- Adopt the advanced skill model as the primary curriculum model to provide students with better and more advanced technical preparation than existing programs.

- Implement program evaluation which includes placement and job performance.

STATE LEVEL SUPPORT:

The following recommendations describe the State level support needed to implement the Tech Prep Partnerships.

- Encourage all community colleges and public school districts within each community college outreach area to develop Tech Prep Partnerships.

- Initiate a statewide public relations plan designed to inform students, parents, the general public and business/industry about the benefits of Tech Prep Partnerships.

- Develop an evaluation tool for measuring the effectiveness of the Tech Prep Programs at three levels - exit from high school, exit from community college and on the job in the workplace.

- Develop model Technical Preparation Programs for out-of-school adults.

- Establish a Tech Prep Advisory Committee to provide direction in terms of workforce needs. This committee should include broad representation from public and private sectors.

- Support the technical assistance office to:

  a. Provide technical assistance to local projects.
  b. Solicit financial support from foundations and grants.
  c. Conduct a cost/benefit analysis for a Tech Prep Program.
  d. Publish a quarterly newsletter emphasizing local Tech Prep Programs that involve business and industry.

- Fund demonstration projects with consideration of:

  a. Diversity of programs in business, health and technical (e.g. manufacturing, CAD-CAM, electronics, etc.).
  b. Alternative guidance delivery systems (e.g. summer programs, counseling centers, use of teachers, business persons, volunteers, and parents).
  c. State geographical distribution.
  d. Diversity of delivery models (e.g. applied academics, vocational/technical education, co-op.).
  e. Involvement of business and industry.
  f. Evidence that partnerships have been formed.

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INTRODUCTION

Both secondary education and community colleges are under pressure to increase the technical content of their curriculum to provide graduates who can fill the highly skilled technician jobs in our changing workforce. The skill levels required of the workforce are so demanding that they cannot be addressed by the high school or the community college alone; there must be a concerted effort at both levels. Our country needs better prepared workers to fill the technical jobs to keep America working. As Dr. Dale Parnell, President and Chief Executive Officer of the American Association of Community and Junior Colleges, says that these current and future technicians

> "...will keep our planes flying, our water flowing, our electricity charging, our hospitals operating, our trains tracking, our computers clicking, our cars running, our laws enforced, and our goods and services sold in a society saturated at every level with technology and information."[1]

Aimed at the general education student in high school, Tech Prep is a new option which is designed to help students form a career goal in a *technical* occupation for which they begin *preparation* in high school and continue toward further specialization and an associate degree at a community college. While the student may be employable at an entry level into an occupation upon leaving high school, the associate degree will be that of master technician which will better prepare students for mid-level positions in business/industry. The premise underlying the Tech Prep Program is that a student who has a career goal, and with a support system to help reach that goal, is motivated to continue to learn. The key structure to implement Tech Prep is partnerships among schools, community colleges and business.

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[1] Dr. Dale Parnell, *The Neglected Majority*. Washington, D.C.: A.A.C.J.C., 1985.

"The Tech Prep/Associate Degree concept provides a dramatic model for educators wishing to avoid slippage and loss of continuity in learning." Parnell

The State Board of Education has a responsibility to set the direction for education in Michigan. At the same time, Michigan has a strong history of local control in the K-12 school districts as well as autonomy for its colleges and universities. Due to the structure and system of education in Michigan, the State Board of Education encourages voluntary institutional cooperation in changing the current system to better accommodate students and facilitate their learning. It is the goal of the State Board of Education that Michigan's educational system will become "all one system" in that students can move from year to year and institution to institution in a smooth, upward direction with as little loss of time or credits as possible.

TECHNICAL PREPARATION

It was within this context and desire for increased educational achievement for Michigan students and understanding of changing work needs that the State Board Education approved a proposal on "Technical Preparation for Youth and Adults into Occupational Education Programs at Michigan Community and Junior Colleges" at its July 1987 meeting. A technical assistance office was established with a curriculum specialist as project coordinator in October, 1987; the project was housed at Schoolcraft College. It was the responsibilities of the Technical Assistance Office to coordinate the Task Force, provide background and research information for the Task Force and disseminate the findings of the Task Force.

When the State Board of Education appointed a statewide Task Force to investigate Tech Prep Programs as an opportunity for educational improvement in the State of Michigan, they were building on a base of prior activities. These prior activities are contained in the reports, *Goals 2000*, April, 1987; and *The Cooperative Education Programs and Services Project*, July, 1987; as well as the Michigan State Plan for Vocational Technical Education which provided for Perkins Supplemental Funds for collaborative guidance and counseling activities and support for Education Development Plans (EDP).

In *Goals 2000*, the State Board of Education identified as major goals, articulation and strengthening career counseling and guidance activities so that all students can advance smoothly from each grade, level, and institution.[2]

Secondly, the Cooperative Education Project resulted in committee recommendations that reflect a desire for more cooperative education programs and services in Michigan. This committee recommended that the State

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[2] *Goals 2000 - Education for a New Century*. State Board of Education, 1987.

Board of Education provide for "seed money" and staff support for cooperative and collaborative efforts among the local districts, the intermediate districts and the community colleges. On this topic, Gary D. Hawks wrote to the State Board of Education:

> "The associate superintendents were directed by the superintendent to establish policies and operational incentives to encourage the local districts, intermediate districts and the community college within their respective areas to facilitate the recommendations of the special committee."[3]

"New and different curricula models must be designed to slow the slippage, to bring more structure and substance to the curricular program, and to make college-program and degree completion more likely for more students."
Parnell

And thirdly, Michigan has been funding collaborative initiatives between high schools and community colleges to promote guidance and counseling activities. Within many of these projects, Education Development Plans (EDP) are viewed as a way of providing better and more focused guidance and counseling for secondary students.[4]

These three prior activities are seen as an integral part of Tech Prep development. Tech Prep is developed on the premise of a smooth transition from high school to the community college. Technical programs are coordinated so that students achieve advanced skills training. Strong guidance in career awareness and exploration is critical to Tech Prep Programs. The Task Force has also endorsed the EDP as an essential part of the Tech Prep Program as a way of strengthening the guidance function. Thus, Tech Prep as envisioned by the Task Force, supports and incorporates these prior recommendations for continuity of learning. However, the key to Tech Prep is the development of a structured curriculum between high schools and community colleges.

TASK FORCE

The statewide Task Force, appointed in September, 1987, was charged "to provide for the development of models for the Tech Prep 2+2 concept, including identification of previous research, competencies, guidance and academic components, and recommended delivery systems" (State Board proposal). The representation of the 23 member task force reflected a balance between secondary and community college educators and career guidance counselors. The Task Force included one member from the State Board of Public Community and Junior Colleges, one member from the Michigan Council for Vocational Education (MCOVE), and one member from the Michigan Career Education Advisory Commission. In the curriculum areas

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[3] *Cooperative Education Programs and Services*. Report on, July, 1987.
[4] *How to Implement an Education Development Plan (EDP)*. Michigan Department of Education, 1987-88.

one K-12 and one community college faculty was selected from each area of mathematics, sciences, communications, and computer sciences. A counselor from K-12 and one from a community college, three secondary vocational education administrators and three community college technical instructors were on the task force. One adult education administrator and one representative from labor completed the task force composition.

STRUCTURE

The Task Force divided into subcommittees at the first general meeting in December, 1987 to carry out the work of the project. These subcommittees were Leadership, Guidance/Counseling, and Curriculum.

The Leadership Subcommittee addressed the structure of partnerships, state support issues, statewide awareness, funding sources, and guidelines for RFP's (request for proposals). The Curriculum Subcommittee examined essential competencies and models for delivery of programs selected for Tech Prep at the local partnership level. The Guidance/Counseling Subcommittee explored and identified key elements of effective career guidance/counseling services required for students to understand educational options at the earliest possible grade.

The recommendations of the Task Force were developed by the specific Subcommittees and shared at a two-day retreat to reach consensus. Some of the recommendations cross subcommittee lines but have been organized to reflect the three subcommittees of leadership, guidance/counseling, and curriculum.

LEADERSHIP SUBCOMMITTEE

The Leadership Subcommittee of the Task Force addressed policy issues for future grants, state level support for demonstration grants, and guidelines for model programs. In this last area, the Subcommittee indicated four areas of interest: that Tech Prep Programs extensively involve business and industry, that programs consider "at-risk" youth, that programs build relationships with adult high school completion programs and community college occupational programs and that programs show significant continuity between the secondary and community colleges as a 2+2 structure.

Leadership also discussed timelines for marketing Tech Prep to target audiences and a timeframe for distribution of grant dollars. The Subcommittee proposed and accepted a statement of its purpose:

We are seeking models of cooperative programs between community college and K-12 or intermediate school districts. These models should be in programs at community colleges in identified vocational or technical areas that through cooperation create stronger educational programs and better prepared graduates for employment.

From this perspective the Leadership Subcommittee proposed the following recommendation for State level support needed to implement the Tech Prep Partnerships.

RECOMMENDATIONS FOR STATE LEVEL SUPPORT

The following recommendations describe the State level support needed to implement the Tech Prep Partnerships.

- Encourage all community colleges and public school districts within each community college outreach area to develop Tech Prep Partnerships.

- Initiate a statewide public relations plan designed to inform students, parents, the general public and business/industry about the benefits of Tech Prep Partnerships.

- Develop an evaluation tool for measuring the effectiveness of the Tech Prep Programs at three levels - exit from high school, exit from community college and on the job in the workplace.

- Develop model Technical Preparation Programs for out-of-school adults.

- Establish a Tech Prep Advisory Committee to provide direction in terms of workforce needs. This committee should include broad representation from public and private sectors.

- Support the technical assistance office to:

  a. Provide technical assistance to local projects.

  b. Solicit financial support from foundations and grants.

  c. Conduct a cost/benefit analysis for a Tech Prep Program.

  d. Publish a quarterly newsletter emphasizing local Tech Prep Programs that involve business and industry.

- Fund demonstration projects with consideration of:

  a. Diversity of programs in business, health and technical areas (e.g. manufacturing, engineering, electronics, public service, etc.).

  b. Alternative guidance delivery systems (e.g. summer programs; counseling centers; use of teachers, business persons, volunteers, and parents).

  d. Diversity of delivery models (e.g. applied academics, vocational/ technical education, co-operative education).

  e. Involvement of business and industry.

  f. Evidence that partnerships have been formed.

In addition to determining the recommendations for the State level support needed for projects, the Leadership Subcommittee of the Task Force proposed these recommendations for local projects:

RECOMMENDATIONS FOR LOCAL LEADERSHIP:

Institutional decision makers form partnerships which:

- Involve top-level decision makers.
- Select program areas that involve business and industry.
- Identify a coordinator for each high school/community college partnership program.
- Ensure that students in adult education high school completion programs have access to Tech Prep Programs.

It is the rare high school student who has more than a vague notion of what an adequate high school preparatory program is all about and how he or she can best prepare to succeed in a community, technical or junior college program."
Parnell

GUIDANCE & COUNSELING SUBCOMMITTEE:

The focus of the Guidance and Counseling Subcommittee was to determine the needs of students for information and assistance in preparing for careers. The Subcommittee discussed when and how this should happen in the context of a Tech Prep Program. Early counseling was identified as crucial. Even though Tech Prep is nationally referred to as a "2 + 2 Program," in Michigan with the counseling component it should be "4 + 2". EDP's should also cover "4 + 2".

In addition the Subcommittee endorsed the EDP as the mechanism for students to develop a career goal and to begin the steps to reach that goal. The Subcommittee believes students will need awareness information on technical careers before the 9th grade so they can take mathematics and science courses early enough to keep up with requirements of a technical curriculum. (See Appendix A for EDP model)

The Subcommittee discussed parental involvement in every phase of the Tech Prep Partnership and strongly held that parents should be included in the planning and implementation that included the guidance functions. In-service training for parents may help them to become a conduit of career information.

The Subcommittee considered expanded career information centers both in school and in the community for written, audio, visual and computerized information about career options. The Subcommittee decided that the school career centers would most likely be involved in a good counseling plan for each school. Since the cost attached to implementing career information centers in the communities may be prohibitive, the Subcommittee decided to remain in a framework of what they believed could be implemented in a Tech Prep Program.

The Guidance and Counseling Subcommittee also want Tech Prep Programs to consider two optional components. One was the involvement of business/industry. Business/industry was viewed as an important link to job information and internship exploration. Since students often do not understand career ladders, organizations, and jobs other than those their relatives have, business leaders can often speak to a cluster of jobs. For example, Dow Chemical has recently developed a series called *Touch Tech*. The series has three parts devoted to *Careers in Science*, *Computers in Industry*, and *Coping with Change*. Business can also assist in planning experiential learning for students. The Subcommittee thought that business involvement in guidance would allow local projects to express how a creative partnership might work.

The second approach was to consider expanding counseling services by redefining teachers' roles, accompanied by retraining and reduction in teaching loads, so that classroom teachers could assume a larger role in handling the guidance needs of high school students. The professional counselors' roles, under this plan, would be to train and assist teachers in their expanded role and to provide direct counseling when that is needed. A paraprofessional staff supervised by counselors, could deliver guidance activities and career information if prepared through inservice training. In some schools, parents perform this role, but often parents are not given enough training to use the career information effectively.

RECOMMENDATIONS FOR GUIDANCE AND COUNSELING

- Include the following key elements of guidance and counseling in each Tech Prep Program:

    a. Student selection into Tech Prep
    b. Career awareness, exploration and self-awareness
    c. Career planning
    d. Student assessment and placement
    e. Education/Employability Development Plan .

- Develop computerized Educational Development Plans (EDP) for each student and up-date annually.

- Involve parents in the guidance process.

- Provide special guidance programs to adults enrolled in adult education high school completion programs.

- Use business/industry for input into guidance plan.

CURRICULUM SUBCOMMITTEE

The Curriculum Subcommittee focused on 1) the definition of Tech Prep, 2) the technical competencies necessary for a student to succeed in a Tech Prep Program, and 3) the various kinds of models used for curriculum development.

The final definition as accepted by the majority of the Task Force was:

Tech Prep Associate Degree programs are community -wide partnerships among school districts, community colleges, and business/labor to prepare youth and adults for entry into career fields.

"All students need a student-centered curriculum." Parnell

Technical competencies were developed by the Curriculum Subcommittee. These focused on mathematics, sciences, communications, and computers. (See Appendix B for total listing of competencies)

It was the recommendation of the Subcommittee that these competencies should be developed across the curriculum but especially in courses in mathematics, sciences, communications, as well as in vocational technical courses which are part of the student's curriculum. These abilities should be demonstrated in both oral and written work and assume that (once course work is finished - including remedial course work) the student can read effectively and speak clearly. In addition, the student will demonstrate technical skill in the use of computers.

Two major models of curriculum in Tech Prep Programs were discussed: (1) the time-shortened model and (2) the advanced skill model, also called a coordinated curriculum.

The most common model is the time-shortened model and it is the simpler to implement. The primary purpose is to reduce the redundancy in the two levels of education. This is done by giving students advanced placement at the college level for courses taken at the secondary level that duplicated the learning in courses at the community college. As a result, students complete a Certificate or an Associate Degree in less time because they earn college credit from secondary courses. Each program at the community college determines how many advanced credits it will allow students. Dual enrollment is often a feature of time-shortened models, with no testing and at no cost.

Advanced skill models streamline occupational program fundamentals in order to make room for the two-year, postsecondary curricula to teach more advanced or specialized areas. The student has more advanced skills for entry into the workforce at a mid-range level rather than an entry-level. The Associate Degree under this model is sometimes referred to as a "master technician" degree. This model is based on preparation in mathematics, sciences, computers, and communications in the high school to prepare for more advanced work at the community college. Examples of this type of program are the Virginia Peninsula Project, Chemeteka Community College in Oregon, Kansas City Metro Schools, and Middle College in New York.

RECOMMENDATIONS FOR CURRICULUM

The Curriculum Subcommittee made the following recommendations:

- Establish a curriculum team of four levels: an advisory committee, a management team, a planning/design team, and an implementation team.

- Include a Technical Core Curriculum based on essential technical competencies as follows: (Appendix B has complete listing)

  a. Abstract Thinking Skills: These include reasoning, problem-solving and decision-making. These skills should be developed in all courses, but especially in mathematics, English, sciences and vocational/technical courses which are a part of the Tech Prep Program.

  b. Social and Work Skills: These include experiences and behavioral expectations such as interpersonal skills, adaptability, accountability, employability, entrepreneurship and work ethics.

c. Technical Literacy: This includes computer literacy as a minimum as well as other technical skills relevant to the specific program.

d. Technology Education: An organization of subject matter which provides opportunities for experiences concerned with developing insights into technology; its evolution, utilization, systems and significance, and its social and cultural impact.

- Adopt the advanced skill model as the primary curriculum model to provide students with better and more advanced technical preparation than existing programs.

- Implement program evaluation which includes placement and job performance.

RESEARCH OF NATIONAL TECH PREP PROGRAMS

BACKGROUND

From their inception, community colleges have been closely aligned to the local public schools and have served as a bridge between public schools and senior colleges. This has been called their transfer role, educating students for the first two years of their projected four-year sequence. However, education for occupational training through two-year programs has also been a key mission of the community college. About two-thirds of community college students are now enrolled in career and technical studies with engineering technologies, business and health having the largest enrollments. Almost all predictions for workforce needs show an increased demand for qualified, skilled technicians.

"One of the vital elements of the community to be served by the community college is the high school. Community colleges must never forget that their roots are in the local high schools. Vocational education and training has been the outstanding success of the community college but you have not thought out your linkages with the high schools."
Governor Bruce Babbitt, ACCT Meeting, 1983

Community colleges currently enroll approximately 43% of the nation's undergraduates and 51% of all first-time entering freshman.[5] Since this large population of students are interested in two-year technical programs, the community college has a great opportunity to meet the higher level technical needs of business and industry. One of the ways to do this is to reduce the remedial education that so many students require when they enter the community college and to emphasize higher level skills at the postsecondary level. To achieve this goal, partnerships between community colleges and secondary institutions could provide a forum to work together at the two levels. In the report on *A Vision for a New Century*, the Commission recommends that:

> "...every community organize a school/college consortium in its region. This partnership should develop a plan for educational excellence. Such a plan would include teacher/faculty enrichment and would provide curriculum continuity in general and technical studies."[6]

Tech Prep Programs, initiated now in many states, are one response to a continuous curriculum between the two levels so that students will have a planned technical program of four years; two years (or more) in high school and two years at the community college. The Commission also recommends that "schools and community colleges join in...arrangements in which technical studies programs begun in high school are completed in a community college, either in Certificate or Associate Degree Programs."[7]

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[5] *Building Communities: A Vision for a New Century: A Report of the Commission on the Future of Community Colleges*. Washington, D.C. A.A.C.J.C., 1988.
[6] Ibid.
[7] Ibid.

Many states are increasing the credit requirements in high schools to include more courses in English, mathematics, sciences, computers and foreign languages. However, the high school drop-out statistics and the enrollment in a general education track show that simply emphasizing the "classical curriculum" or college prep track will only further isolate students of the middle majority. These students are neither college bound nor enrolled in vocational programs. They graduate "neither ready for college nor for work."[8]

Dr. Dale Parnell refers to these directionless high school students as the "neglected majority, who see no connectedness, no aim, no purpose to their education, also often seeing no point in continuing in school."[9]

"More and more young people emerge from high school ready neither for college nor for work. This predicament becomes more acute as the knowledge base continues its rapid expansion, the number of traditional jobs shrink, and new jobs require greater sophistication and preparation."
Parnell

Not surprisingly, these students make decisions which propel them outside the educational arena. Nationally, 30% of students enrolled in high school drop out before graduation and more than 75% of those who graduate never complete a Bachelor of Arts degree. There are clear associations between low retention rates and the type of curriculum available to students. Approximately 65% of high school dropouts were enrolled in the general track at the time they left school (see Table 1). Parnell believes that the system does not have place for students who do not fit into an academic or vocational track. The students are in a vacuum... " a road to nowhere" and they perceive the system as meaningless to their lives.[10]

In recent years, this general education track has grown from a dirt path to a freeway. The years between 1969 and 1981 witnessed a 400% increase in the proportion of high school students enrolled in the general track, from 12% to 42.5% (See Table 1).[11] This rapid increase has effects far beyond the waste of potential associated with failure and frustration. The national economy can ill afford to waste this human potential when the need for a technically trained workforce is a national priority for international competition. And community colleges can ill afford all the remedial services necessary to transform the "neglected majority" into productive workers and technicians. In addition, the taxpayers can ill afford the duplication of effort on the part of the two levels of education.[12]

Table 1 **CURRENT NATIONAL TRENDS OF HIGH SCHOOL STUDENTS**

GROUP	1969	1975-81
Academic Track	48.8%	36.4%
General Track	12.0%	42.5%
Vocational Track	25.6%	19.0%
Missing Cases	13.6%	2.1%

Source - *The Neglected Majority, Dale Parnell, 1985*

[8] Parnell, *The Neglected Majority.*
[9] Ibid.
[10] Ibid.
[11] Chemeketa Community College, Salem, Oregon. *Proposal for Tech Prep Grant*, 1987.
[12] Parnell, *The Neglected Majority.*

RESEARCH ACTIVITIES: NATIONAL FOCUS

National and state models of Tech Prep were reviewed to develop a list of key components that are essential for program success.

A large number of programs were reviewed, either through telephone discussion, site visit, and/or document analysis. Visits to the American Association of Community and Junior Colleges directed the choice of models. The Clearinghouse on Tech Prep Literature at Tri-County Technical College in South Carolina provided discussion and written information on a variety of projects. In addition, telephone conversations with project directors around the country provided valuable information.

The major projects that supplied information to the Task Force are the Virginia Peninsula Project, the Portland, Oregon Project, the Oklahoma Project, and the Bakersfield Project in California.

Literature was provided by Oklahoma Community College, Springfield Community College, Massachusetts; Williamsport Community College, Pennsylvania; and Moraine Park Technical College, Wisconsin. While the Middle College High School in New York on the La Guardia Community College campus goes beyond Tech Prep in its intent, it became an important model for "at-risk youth". The Kansas City Metro School's partnership with a four-year college on technical preparation, was also useful.

Table 2 shows four programs that have implemented a coordinated curriculum model. That is, each of these programs has taken a zero-based approach to revamping both the curriculum at the secondary and community college. They have started with the fundamental question, "What does a

Table 2 **MATRIX FOR PARTNERSHIP PROGRAMS COORDINATED CURRICULUM MODELS**

March 28, 1988

School Districts	Executive Committee	Plan Time	Fund Source	Implement Area	Guidance Counseling	Curriculum Team	Bus. Link	Professional Development	Public Relation
Chemeteka Comm. College, Oregon	Yes	12 months	Grant	Local	No	Yes	Yes	Yes	Yes
Kansas City Metro Schools	Yes	Continuing	Grant	Regional	No	Yes	No	Yes	Yes
Middle College HS/La Guardia, New York	Yes	2 year	Perm.	Regional	Yes	Yes	Yes	Yes	Yes
Virginia Peninsula T. Nelson Community College, Virginia	Yes	2 year	Perm.	Regional	Yes	Yes	Yes	Yes	Yes

student need to learn in secondary education about *X* (any occupational program) in order to be ready for advanced work at the postsecondary level, or to enter the workforce at an entry-level position?" Once the key competencies for secondary is defined, then the key competencies for specialization or advanced work at the community college can be planned. This is not an easy task. The questions of what will be taught at each level are complex; therefore, it should be expected that a reasonable timeline be established. Some programs recommend a stage by stage implementation approach and that the curriculum team focus on one curriculum area for their first coordinating task. For example, the Virginia Peninsula Project chose Electronics/ Electromechanical Technician as their first program.

By reviewing various models of Tech Prep, several characteristics have been predominant in the sucessful programs and need to be outlined to help those schools who are planning to develop Tech Prep Programs.

KEY ELEMENTS OF TECH PREP PROGRAMS

Tech Prep Is:

Preparation for College Level Courses.

Preparation for Career Employment.

Preparation for University Transfer.

Integrated Progression from High School to Technical College.

Counselor/Advisor Oriented.

Structured Curriculum.

Business/Industry Oriented.

The following is a summary of the key elements of Tech Prep Programs as indicated by the literature and institutional visits.

Structure: Includes an executive committee and an operational committee. The executive committee attends to policy issues and funding for the project. The operational committee has all stakeholders represented and directs the day to day operation. See Appendix C for three models of organizational structure used for Tech Prep Programs.

Planning: Takes from one to two years, which includes awareness (public relations) activities in the entire community and staff awareness through inservice with teachers and counselors.

Participation: All those who participate in the partnerships should volunteer and commit to a timetable. Most partnerships develop agreements signed by all parties. Even teachers and counselors from local districts should volunteer for the program.

Implementation Decisions: Each project must decide how focused the programs will be with recommendations from existing programs that the focus be on one or two programs in related areas for a start. Plan for a phase-in process to expand to other program areas.

Guidance/Counseling: Representatives from both secondary and postsecondary counseling staff should sit on the operational committee. Inservice programs should be held for all counselors; some programs developed a kit of information for counselors to recruit students into the program.

Curriculum Teams: Teachers from all levels of the programs selected for coordination should be represented on the teams, including vocational education teachers. Business representatives should be consultants to the curriculum and contribute to the generation of skills needed for any particular program.

Business Partnership: In many national programs business is a key partner with the school systems. Examples of how business/industry may be involved in Tech Prep Partnerships is discussed below.

Public Relation/Dissemination of Concept: A plan for awareness activities to all interested parties should be developed and implemented as a continuing activity.

Evaluation: A plan for formative and summative evaluation should be a part of the planning process.

Coordination: Needed at the secondary level and postsecondary level.

Appendix D includes examples of curricula on three Tech Prep Associate Degree Programs: 1) Electronics, 2) Medical Technology, and 3) Business Administration. These are taken from the Portland, Oregon - *Guide to Tech Prep for Students.*

Tech Prep is NOT merely:

College Credit in High School.

Articulation for Existing Courses.

Vocational Only.

Advancement Placement for High School.

Provided by Don Garrison, Tri-County Community College, South Carolina

BUSINESS: The Third Partner

While curriculum is at the heart of the Tech Prep Partnerships, important assistance can be forthcoming from business/industry as an equal partner. Business links make good sense for Tech Prep.

While secondary schools, vocational education and community colleges can all address employment issues, it is necessary that business/industry be included in the dialogue. The employer is the expert on the workforce competencies needed by all students. There are a number of levels business can serve in Tech Prep Partnerships.

Business can sit on an executive council with other high level officials from community colleges and secondary institutions. In this high level role, business can take part in systematic educational improvement. At this level leaders identify the workforce needs and how education can respond by specific program development.

Partners in management allow school officials to tap business expertise and management support. Some areas that may be helpful are strategic planning, legal assistance, organizational development, performance standards, and equipment issues. Another area local projects can tap is business knowledge of public relations and marketing. Partners in curriculum development allow business to assign workers in the program area under change to participate in identifying the skills a student needs for entry level work and for advanced level work. This will help the curriculum specialists from the educational system to include competencies identified from practice. Often first line supervisors are used in this capacity for technical programs. A speakers bureau from business speaking to the high schools will often provide students with a realistic view of the technical field under consideration. Speakers will tell the student the salary range to be expected along with the number of job openings in the years the student may expect to graduate. The Virginia Peninsula program has this feature.

Partners in teacher training and development allow business to provide opportunities to teachers to update, upgrade or maintain skills (for example, to learn latest applications of technology in science), to learn more about the labor market, businesses in the community, workplace needs and career opportunities for their students.[13]

Businesses can also provide short-term projects, student activities, and resources. This might include assisting in fund raising, sponsoring specific events through contributions, supporting scholarships, funding incentive programs, donating or sharing materials or equipment, or underwriting career fairs. The important feature of the relationship with business/industry is that it be continuous and that a staff person be assigned to keep business involved in the program.

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[13] *The Forgotten Half: Non College Youth in America.* Wm. T. Grant Foundation Commission on Work, Family and Citzenship, 1988.

RESEARCH ACTIVITIES: MICHIGAN FOCUS

There is a compelling need to provide additional and/or different educational programs in order to bette: meet the needs of students as well as the workforce needs of tomorrow. There is clearly a mismatch between the basic academic skills of many young adults and the requirements demanded by the present and emerging fields of work, particularly those involving "new technologies." The evidence points to serious unmet needs that call for intervention to improve the situation. According to Dr. James Jacobs of the Industrial Technology Institute, "one of the fastest growing jobs in Michigan's otherwise shrinking industrial occupational base, is that of technician.[14] In order to bring unmet needs to light, one must examine 1) the state of our educational system, 2) the needs of the workplace in Michigan, and 3) the role of community colleges in providing technical education.

EDUCATION IN MICHIGAN

Our secondary education system in Michigan graduates 72.5% of its youth, placing thirty-second in the nation on this measure, according to the Hodgkinson report.[15] Nationally one study estimates that the reading skills of a typical high school graduate is that of a student in the sixth month of ninth grade. Estimates are that 13% of white seventeen year-olds are functionally illiterate, while 47% or Blacks and 56% of Hispanics fall into this category.[16] The reason we must be concerned about this disparity in numbers is that 24% of school children in Michigan are minorities. As Hodgkinson points out, Michigan's future will depend heavily on how well these increasing minority populations do in education and jobs.[17]

"Michigan graduates 72.5% of its youth, placing it thirty-second in the nation." Hodgkinson

Increasing the skills of all students in our educational system is important for the quality of life of our youth and important for the State to attract and keep businesses that provide the jobs for our students. Business/ industry has stated a priority for an educated workforce in their choice of locating new business.[18]

While it is not productive to focus on the results of secondary education, it is productive to focus on a goal of reducing the drop-out rate, increasing skills and expanding our definition of basic skills beyond academic subjects to include employability attitudes and skills. Thus the schools and employers

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[14] James Jacobs. *Training and Public Policy - Final Report.* Ann Arbor. Industrial Technology Institute, 1987.

[15] Harold L. Hodgkinson . Michigan: The State and its Educational System. Wash. D.C.: Institute for Educational Leadership, 1987.

[16] Mingle, J. L., *Focus on Minorities: Trends in Higher Education Participation and Success.* Denver: ECS, 1987.

[17] Hodgkinson, Michigan: The State and its Educational System, 1987.

[18] Elizabeth L. Useem. *Low Tech Education in a High Tech World.* New York: Free Press, 1986.

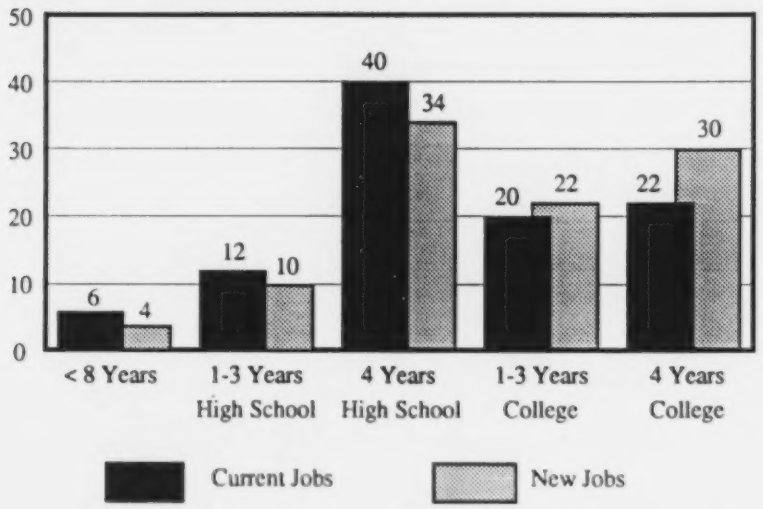
have a context to join forces to unify education and training for the future. There is evidence that the needs of the work force will require students to go beyond high school to prepare for jobs in a high technology environment. One estimate is that fully 52% of new jobs will require one or more years of college by 1995.[19]

WORKFORCE IN MICHIGAN

The central question for education is how many students will be prepared to fill the high paying jobs requiring advanced technical skills. Many writers see a split in the near future between those who can function in a technical environment and those who will be stuck in minimum wage jobs. It is the technical/professional category of work, a high growth area, that generally pays the highest salaries. Table 3 shows that jobs requiring 1-3 years of college are growing as are those that require 4 years of college. The fastest declining area is the percentage of jobs requiring a high school education.[20]

Table 3

NEW JOBS REQUIRE MORE EDUCATION



The old jobs requiring little education are decreasing. The new manufacturing floor is increasingly automated; design and drafting work are based on Computer-Aided Design. Consider, for instance, the changes in the field of nursing. According to a recent study of 79 hospitals in Michigan over 70% of the nurses are using computers.[21] Couple this with the doubling of medical information every two to three years, and the need for a technically proficient and lifelong learner becomes essential.

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[19] *Countdown 2000: Michigan's Action Plan for a Competitive Workforce*, 1988.
[20] Ibid.
[21] Michigan Community College Consortium Report, *Computers in Nursing*, 1987.

Michigan workers in the past have depended on high paying jobs in factories that required relatively low education attainment. However, these jobs have been disappearing and can no longer be handed down from generation to generation. The new manufacturing jobs will look quite different from the past. They will require skills to understand automated technology as the factory floor becomes increasingly computerized, and the factories change with the microelectronic revolution. Large segments of secretarial and clerical work have become automated by word processing equipment. The printing industry is being transformed by electronic typesetting and photo composition; it will be further affected by electronic mail and electronic publishing. Banking is becoming increasingly automated. Retailing is being changed by "smart" terminals where orders may be taken in stores by interactive video on kiosks. Libraries at many large universities and cities are "on-line" and computers as an instructional tool will transform the way education is delivered. In short, microelectronics is transforming industrial, professional and service occupations.[22]

"The 20 fastest growing occupations in 1982-1995 all prefer postsecondary education and training, e.g. computer science technician, office machine service technician, engineering technician, banking and insurance personnel. Only two of the 20 require a baccalaureate degree for entry."
Parnell

As a result of the technology revolution, the jobs of today and tomorrow will require that education and training programs go beyond the traditional "basics". The new jobs will require the ability to read a variety of materials, including charts, graphs, and to use this information to solve problems; the flexibility to manage a changing world of work and have a positive attitude toward work; and a willingness to be involved in continuing education to update knowledge and skills.

As Michigan replaces manufacturing jobs with service jobs, the result will be a reduction of unemployment, but at the same time a decrease in per capita and household income.[23] However, since there will be an increased demand for qualified skilled technicians, education can play a leadership role in sending this message to young people: they have a choice of low-paying unskilled jobs such as custodian or fast-food worker or they can plan a program to stay in the educational system until they are qualified for the higher skill jobs. This serious role for education will require a concentrated effort at technology education so that students understand both the opportunities in the world of work and the plan to prepare for their place in this world. The community college can play an important role with secondary education in partnerships to prepare students for good jobs.

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[22] Useem. *Low Tech Education in a High Tech World.*
[23] Hodgkinson. Michigan: The State and its Educational System.

THE ROLE OF COMMUNITY COLLEGES IN TECHNICAL EDUCATION

Enrollments in Michigan community colleges have grown dramatically since 1960, approaching the four-year colleges in enrollment numbers. By the fall of 1986, almost 209,000 students were enrolled in Michigan community colleges. Approximately half of these students are taking courses to transfer to a baccalaureate program, while the other half are enrolled in technical programs for job preparation.[24]

Both the transfer role and the technical preparation programs are seen as high priorities by the community colleges and the general public. In the Public Opinion Poll conducted by the Michigan Department of Education, 87% of the respondents believed that it was "very important" for community colleges to provide academic training leading to a bachelor's degree and 83% believed it was "very important" to provide vocational/technical training.[25]

Transfer programs are based upon the four year institutions' requirements for transfer credit and are developed through written agreements on transfer guides. Vocational programs, however, are developed through needs assessments of local industry. Upgrading of these programs is done through systematic reviews using mandated evaluation procedures. Input is solicited from faculty, students and business.

One of the most difficult problems in program development is the time needed to teach technical "specialty" areas. Such emerging program areas as Biomedical Technology, Laser/Optics, Sonography (Ultrasound), and Data Communications are often built upon a two year core program and then add on advanced skill courses. Community college instructors have been advocating 3-year technical education programs, stating, "with the quality of student coming to us, we simple cannot get it done in 2 years."[26] It must become the role of the community college to identify the needs of industry, and with the input from local high schools, structure a curriculum which will provide the students with the competencies needed to succeed in the workplace.

MICHIGAN PROJECTS

It is important in Michigan to assess the work that is currently being done. This section reviews three Michigan programs in detail and summarizes other program activities. The three Michigan Projects which presented their programs to the Task Force were: 1) Montcalm Community College

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[24] *Conditions in Postsecondary Education in Michigan 1987*, State Board of Education, 1987.
[25] Ibid.
[26] Parnell. *The High School/Community College Connection Has Opened the Door for Millions of Americans*. ATEA Journal. Jan-Feb, 1987.

with the Ionia Schools, 2) Southwestern Community College with Lewis Cass Intermediate School District, and 3) *The Education for Employment* program in Kalamazoo County.

Although not all the Tech Prep components may be part of the three projects described below, these projects have implemented important parts of Tech Prep.

IONIA/MONTCALM PROJECT

Ionia Public Schools, Montcalm Community College and the Ionia County Vocational-Technical Education Consortium, are developing what is currently being referred to as the Ionia/Montcalm Project. This project exemplifies an excellent leadership/planning component of Tech Prep.

The goal of this project is to develop programs, systems and facilities of a Tech Prep 2+2 comprehensive vocational-technical training and retraining program for youth within high school settings and continuing through community college training extending through adulthood. The coordination includes the design of facilities which will be shared by the secondary students from five high schools and Montcalm Community College students, as well as a regional business and industry employees for retraining and advanced training purposes.

The program is intended to parallel the current baccalaureate degree prep program and requires a blending of general education and vocational-technical education. The foundation is technically related skill development in math, science, communications and technical skill development - all in an applied setting. This high school program will dovetail with specific technical programs in technical, community, and junior colleges, leading to an Associate Degree or Certificate.

The planning and development of the program had addressed six major areas: Administrative Support, Articulation Agreements, Review of Graduation Requirements and General Education Course Content, Vocational-Technical Curriculum Review of Graduation Requirements and General Education Course Content, Vocational-Technical Curriculum Review, Secondary/Postsecondary Joint Business Industry Advisory Committees, and Joint Selection of Equipment.

TECH PREP 4 + 2:
LEWIS CASS ISD-SOUTHWESTERN MICHIGAN COLLEGE

The Lewis Cass Intermediate School District and Southwestern Michigan College have entered the second year of a unique and distinctive tech-prep program. Cooperating in the undertaking are the Cassopolis, Dowagiac, Edwardsburg and Marcellus School Districts. The project is supported with federal, state, and local dollars. The cooperating institutions agree that for meaningful articulation to take place in a tech-prep endeavor, preparation of the student must begin at the ninth grade and extend across all career choices and staff must be properly trained, in this case through inservice activities. This project exemplifies an excellent guidance/counseling component of Tech Prep.

During the 1986-87 start-up phase, three major objectives were proposed and completed. First, development of a CEPD (Career Education Planning District) Master Plan for job placement services for both secondary and post-secondary students. Second, development of a Placement Community Discovery Program (PCDP), with these seven activities:

1) assistance to occupational instructors in employability skills, arrangement of community tours, community speakers, and articulation with the college on entrance placement tests

2) individual assessment of all students

3) inservice for secondary and post-secondary vocational/occupational instructors

4) a "Community Awareness Day" for juniors and post-secondary students

5) a "Community Job Guide"

6) a "County Job Search Map"

7) inservice training for placement and career counselors

The third objective, development of a career guidance system for grades 8 through 14, has included these activities: an employability development plan for eighth graders, reevaluate the career cluster program and future plans for eighth graders, reevaluate the career cluster program and future plans for ninth through twelfth graders, including a shadowing program for tenth graders; explain the "2+2 Program" to eleventh graders, an in-service for all counselors and high school principals, a field trip for teachers and students to

visit business, industry, skill centers, and community colleges, and a special counseling program for high-risk students. The program will continue to be refined in order to provide the best possible education for life long success in the world of work.

EDUCATION FOR EMPLOYMENT SERVING KALAMAZOO COUNTY

THE TECHNOLOGY EDUCATION PROGRAM

This project exemplifies an excellent curriculum development component of Tech Prep. Three programs have been developed for the high school Technology Education Program. The courses, entitled *Physical Technology Systems*, *Information Technology Systems*, and *Bio-Related Technology Systems*, form the cornerstone. High school students, in Kalamazoo County, have the opportunity to select any or all three of these courses. As program size allows, additional courses should be offered that support the three major content areas of "Technology Education". Those courses are as follows:

Manufacturing Systems - Construction Systems - Transportation Systems -	} Physical Technology Courses
Network Communications - Computer Application in Technology -	} Information Technology Courses
Technology in Society - Special Problems in Technology -	} Bio-Related Technology Courses

Technology Education is defined as an organization of subject matter, which provides opportunities for experiences concerned with developing insights into technology, its evolution, utilization, systems and significance, and its social and cultural impact.

As a vital part of general education, *Technology Education* should:

- Provide learning experiences for students of all grades and abilities. It is equally important to everyone because all members of society must have a conscious awareness of our ever changing social structure in order that they understand, function in, and control the technological environment.

- Provide technical skills and knowledge basic to most occupations and professions. Employ actual involvement with tools, machines, materials, processes, and technical concepts.

Provide students with the opportunity to adapt to a changing environment through problem-solving techniques that enhance attitudes and abilities towards creative thinking.

ADDITIONAL MICHIGAN ACTIVITIES

Programs in process for building Tech Prep:

1. Washtenaw Community College with area vocational administrators and local high schools are planning with consultants from the National Center on Vocational Education to build a base for implementation of a coordinated curriculum. Washtenaw had a cooperative program in place from the earlier articulation project.

2. Schoolcraft College with Detroit Public Schools and the Breithaupt Skills Center are planning a coordinated curriculum in two program areas, Culinary Arts and Pre-engineering. Standards for students entering the community college will be set. Skills at both levels will be agreed upon in curriculum team sessions so that students will have a four year curriculum in these two areas. Curriculum meetings are underway.

3. West Shore Community College has invited all high school superintendents in its area to a meeting for planning an administrative structure and steps to move ahead with the technical preparation of its students for technical careers.

4. Oakland Community College recently presented Dale Parnell to its district secondary units as a prelude for the planning and implementation of a technical preparation curriculum to serve its students. They have a planning structure in place.

5. Kalamazoo's Education for Employment Program has elements which mirror Tech Prep Programs around the country, particularly its administrative structure and its Intro to Technology career awareness courses. These three areas of study: Physical, Information, and Bio-Related Technologies introduce students to an area of study early, so they may select a career goal and a plan to reach that goal.

6. Southwestern Michigan Community College with the Dowagiac Schools and others in their service area have developed a comprehensive guidance/counseling/inservice program which is a model for that component of Tech Prep strategies.

7. Montcalm is planning a program with the Ionia secondary schools in connection with their new Unified Technology Center to implement a Technical Preparation Program for all high school students.

8. The Kent Metropolitan Articulation Consortium Administration Council is an administrative structure in place in Grand Rapids. Composed of Grand Rapids Community College administrators, high school administrators, area vocational center representatives, department heads and counselors, this consortium was called together "to provide for the orderly and expeditious progression of students from secondary vocational education programs to occupational education programs at Grand Rapids Junior College so that a high quality of vocational education is maintained, and so that unnecessary duplication of course content and its attendant costs are avoided." KMAP, 1986.

9. Bay de Noc Community College had established a Partnership in Economic Development which could be the guidance base for a technical preparation program. They have the business relationship in place. The program is a method of specialized career orientation, training and personal development. In it, "students can acquire job skills in non-traditional areas while learning from business professionals...a required parallel course provides instruction in the following: job interviewing, interpersonal relations, resume preparation, basics of the American enterprise system, and the psychology of adopting a positive attitude." *Partnerships in Economic Development*, n/d.

CONCLUSION:

Is our educational system willing to meet the challenges of the Information Age by changing our own structures to serve students as the workers in the new age? Business and Industry have gotten into the education business reluctantly because of their perception of a mismatch between their demands for a highly skilled workforce and the skill level of students graduating from high school. Indeed, in some instances, business competes with education by offering Corporate College degrees. Maccabees Mutual Life Insurance in their College of Service "virtually runs a Master's level curriculum" with the course material and credit certified by most major universities.[27] Corporate degree programs now exist in nineteen companies in seven states. In Michigan, the corporate college is G.M.I. Engineering and

[27] Dan Russie. Paper Presented at Michigan Tech Prep Conference, *Continuity of Learning*, May, 1988.

Management Institute that offers the A.A.S and the B.S. degrees.[28]

However, the general flavor of the literature suggests that business would like to be less involved in education. What business is suggesting is a major investment in basic skills and employability skills in the secondary schools with business leadership creating the jobs and assisting in funding adult training at the post-secondary level. Tech Prep provides a structure for addressing the roles of each partner.

From the discussion above of selected programs in Michigan, it can be inferred that this State is committing existing resources to form a structure on which Technical Preparation (Tech Prep) Partnerships can be built. Administrative structures between technical education, ISD's and community colleges are already in place in many districts through the older articulation programs. Many of these consortia are still active.

Additionally, community colleges have existing relationships with business through their occupational advisory committees. This means that the relational structure is already in place, an important beginning. In addition, the State program, Partnerships for Education, has already involved business/industry in relationships with the secondary schools. That program sees collaborative arrangements with Tech Prep programs as serving the needs of both cooperative initiatives. Arrangements have been made to explore how the two partnership programs can exchange benefits for the improvement of education.

Tech Prep, then, is just one approach to an enormous problem, but it is a beginning, a place to "carry on." Tech Prep continues the National and State of Michigan initiatives to improve education through partnerships and collaborative education arrangements. These partnerships between business and education can ensure "continuity of learning" to prepare students for technical careers.

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[28] Pearson, The Future of Work and Education: Collaboration for Survival.

APPENDIX A

EDUCATION DEVELOPMENT PLAN From "How To Implement An Educational Development Plan (EDP)"

WHAT IS AN EDUCATIONAL DEVELOPMENT PLAN?

An Educational Development Plan (EDP) is a systematic arrangement, whereby students first choose careers which match their interests and then select courses or subjects which enable them to reach their career goals.

The process involves the interaction of students, parents, and counselors in discussions about the students' grades, test scores, and work experiences in relation to the student's desired career goals.

The student is initially involved with career awareness and career exploration activities in the elementary grades. In the middle/junior high school, students learn more about themselves (value, interest, temperaments, etc.) and begin to zero in on jobs they may desire after high school graduation. Students begin choosing courses to meet certain goals - possibly jobs after high school graduation or post-secondary training.

In high school, students begin to refine their thoughts regarding the kind of career they want as they become more cognizant of their "matured" interests, temperaments, and ambitions. They begin to acquire a feel for their capabilities as they accumulate grades. In some cases, student become aware of their aptitudes from school-wide testing. Some become involved in work experience and co-op activities.

STEP 1 The process begins during the ninth grade when students discover their interests and preferences via the Michigan Occupational Information System (MOIS). Student profiles are established and a list of occupations which match those profiles is identified. The administration of this activity is termed "the MOIS Structured Search." The first step involves the students recording on the EDP form two occupations which interested them.

This transpires during the ninth, tenth, eleventh, and twelfth grade years. Students are given a chance each year to change their minds - to indicate what their interests are at the time, to explore, and to research occupational information from MOIS.

STEP 2 The second step comprises testing students for aptitudes and recording the results. Counselors then discuss students' career choices using MOIS results, test results, and grades.

STEP 3 The third step consists of the students choosing courses which coincide with the career goal(s) which they selected. If a student's grades are not satisfactory, the counselor, student, and parent can discuss the course of action the student should take to remedy the problem. Perhaps the student should study harder, or readjust their thinking regarding their career goal to find something more realistic. Students may be advised to find part-time jobs or co-op experience to help them decide on certain careers.

STEP 4 The fourth step is the recording of any work experience on the EDP form.

STEP 5 The fifth step is comprised of the counselor's writing recommendations on the EDP form.

STEP 6 The sixth and last step involves the parents, students, and counselors signing the form agreeing that the outlined plan is the best course of action for that one year.

The sample EDP form exhibits four sections. Each section is used for one year (grades 9-12).

The Activity Record provides an instrument for articulation between counselors of middle/junior high and high school levels and between local high schools and vocational/technical centers.

The goal of the EDP is to ensure that each junior high/high school student selects a career goal through:

1) improved career counseling techniques.
2) specific selection of basic academic skill classes (including science and foreign language as required).
3) necessary pre-vocational/technical experiences.
4) specific employability/job-seeking skills training.
5) specific vocational/technical job-skill training classes, if appropriate.

The idea of the EDP process is to tie together the entire educational process for 7-12 grade boys and girls (i.e. math, science, English, vocational/technical education, etc.) into one meaningful experience. The purpose for students is not "if they are going to college or not", but "what is their career goal" and "how do we as professionals in education successfully get them there."

EDUCATIONAL DEVELOPMENT PLAN (EDP)

Name _____ Social Security # _____ Birth Date _____ School _____

DIFFERENTIAL APTITUDE TESTS

	Verbal Reasoning	Numerical Ability	VR + NA	Abstract Reasoning	Clerical Sp & ACC	Mechanical Reasoning	Space Relations	Spelling	Language Usage
Raw Score									
Percentile									

D.A.T. Groups of Jobs/Occupations

_____

_____

_____

Grade _____ Date _____

STUDENT'S CAREER CHOICE **EDUCATIONAL GOAL**

1. _____ 2. _____

<== plan to achieve goal ==>

Math _____ _____

Science _____ _____

English _____ _____

Social Study _____ _____

Elective _____ _____

_____ _____

Vocational Skills _____ _____

Comments _____

_____

_____

_____

Counselor Signature

_____ _____

Student Signature Parent Signature

Grade _____ Date _____

STUDENT'S CAREER CHOICE **EDUCATIONAL GOAL**

1. _____ 2. _____

<== plan to achieve goal ==>

Math _____ _____

Science _____ _____

English _____ _____

Social Study _____ _____

Elective _____ _____

_____ _____

Vocational Skills _____ _____

Comments _____

_____

_____

_____

Counselor Signature

_____ _____

Student Signature Parent Signature

Grade _____ Date _____

STUDENT'S CAREER CHOICE **EDUCATIONAL GOAL**

1. _____ 2. _____

<== plan to achieve goal ==>

Math _____ _____

Science _____ _____

English _____ _____

Social Study _____ _____

Elective _____ _____

_____ _____

Vocational Skills _____ _____

Comments _____

_____

_____

_____

Counselor Signature

_____ _____

Student Signature Parent Signature

Grade _____ Date _____

STUDENT'S CAREER CHOICE **EDUCATIONAL GOAL**

1. _____ 2. _____

<== plan to achieve goal ==>

Math _____ _____

Science _____ _____

English _____ _____

Social Study _____ _____

Elective _____ _____

_____ _____

Vocational Skills _____ _____

Comments _____

_____

_____

_____

Counselor Signature

_____ _____

Student Signature Parent Signature

APPENDIX B

Technical Competencies

TECHNICAL PREPARATION COMPETENCIES

REASONING, PROBLEM SOLVING, AND DECISION MAKING:

1. The student should demonstrate the ability to:

   a. Gather and interrelate facts and input and sift through details to identify, conceptualize and recognize the implications and significance of problems, and resolve them through analysis, conclusion, recommendations, and decisions.

   b. Recognize the inconsistencies between the way things are and the way they should be and initiate problems solving techniques to resolve the situation.

   c. Distinguish among facts, assumptions, and opinions.

   d. Use inductive and deductive reasoning to include diagnosing and trouble shooting technical problems.

   e. Use decision making tools (i.e. risk and benefit criteria; development and description of alternatives, comparison, conclusions, and recommendations; ethical concerns) to separate problems into manageable proportions.

   f. Relate knowledge, experience, and principles to new situations.

   g. Change behaviors.

   h. Evaluate, adapt, and develop logical steps to implement decisions.

2. These abilities will be developed in all course work but especially courses in mathematics, science, communications, as well as in vocational technical courses which are part of the student's curriculum. These abilities should be demonstrated in both oral and written work and assume that (once course work is finished - including remedial course work) the student can read effectively and speak clearly. In addition, the student will demonstrate technical skill through the use of computers.

   a. *MATHEMATICS* - The student should demonstrate an ability to calculate through the level of ratios, proportions, and percentages; to support ideas quantitatively; to estimate; to use division, multiplication, addition, and subtraction with real numbers, decimals, fractions, integers, roots, and powers; to calculate distance, weight, area, volume, and time; to use the metric system and to convert between metrics and traditional systems; to read and to create charts, tables, and graphs; to apply mathematics in the solution of economic and technical problems.

   b. *SCIENCE* - The student will demonstrate the ability to recognize medical, physical, chemical and biological problems and solve selected problems through the application of basic scientific principles.

   c. *COMMUNICATION* - The student will demonstrate the ability to read, comprehend and interpret written directions, technical publications, reports, policies and procedures, diagrams and charts. The student also will demonstrate an ability to ask and answer questions coherently to obtain clarity, and verify information; conceive, develop and organize ideas about a subject and present them clearly in standard oral English; present oral reports succinctly; take part in

and interpret the exchange of ideas in discussions.

d. *CIVICS AND GOVERNMENT* - The student will demonstrate the ability to understand the relationship between civic responsibilities and civil rights and entitlements; distinguish between liberty and license; respect the rights of others and the need for statutory authority.

INTERPERSONAL, ADAPTABILITY, EMPLOYABILITY, ENTREPRENEURSHIP, WORK ETHICS

1. *INTERPERSONAL RELATIONSHIPS* - The student should relate to and develop good working relationships with superiors and co-workers in an occupational role; demonstrate behaviors appropriate to the workplace; understand the value and function of courtesy, compassion, fairness, humor, and positive attitude in human relationships; deal with conflict or criticism in a rational, productive manner; understand and be able to participate in the team concept; understand the destructiveness of stereotypical biases and prejudices on human relationships; understand the basis for thoughts, feelings, motivations, and behavioral styles of others, and interact accordingly; recognize social and cultural implications and follow accepted societal rules.

2. *ADAPTABILITY* - The student should demonstrate the ability to adjust to change in schedules, assignments, procedures, personnel, and policies; to engage in continued learning in job training to improve or upgrade skills, or to learn alternate or more difficult skills.

3. *EMPLOYABILITY* - The student should demonstrate the ability to complete the procedures necessary to obtain employment including filling out applications, writing resumes, and preparing for an interview; to identify personal and technical skills and abilities and outline work objectives; to comprehend the relationship between job specifications and personal characteristics and to develop competencies to match the specifications; to understand the principles of competition, cooperation, and leadership in a work environment; to understand the principles of compensation to include pay, benefits, perquisites, and intangibles.

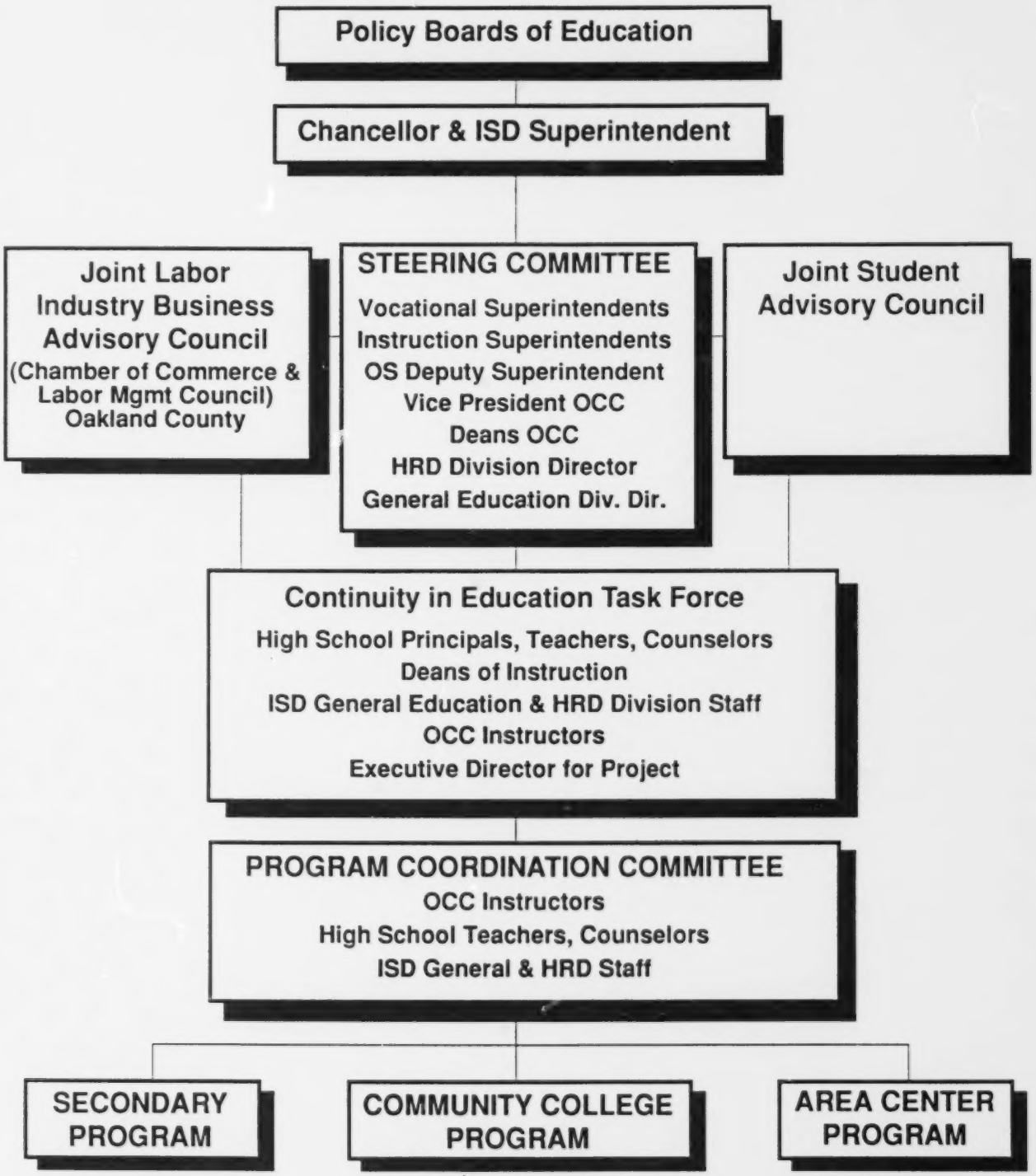
4. *ENTREPRENEURSHIP* - The student should demonstrate the ability to understand how a business is organized and capitalized, the role of management and competition, the demands of productivity and profitability and risk; to understand the need for structure and organization in an enterprise; to understand the role of experimentation in research and development in technological occupations; to understand accountability for results; to understand that progress in technology is a function of initiative, innovation, and trial-and-error experimentation, and that failure, as well as success, in experimentation, is to be regarded as an essential ingredient in progress.

5. *WORK ETHICS* - The student should demonstrate the ability to accomplish assigned tasks with or without supervision; to demonstrate ingenuity in meeting challenges; to concentrate on the job to be done; to take pride in quality craftsmanship or service; to exercise initiative; to accept and seek out responsibility; to keep tools, machines, and work stations in good order; to distinguish between what belongs to the organization and what belongs to the person; to interpret goals, make realistic plans, set priorities, and to take action to meet them; to maintain dependable attendance and punctuality; to maintain standards of appearance, dress, grooming, and personal hygiene; to understand the meaning of "work" and the significance of "a day's work for a day's pay".

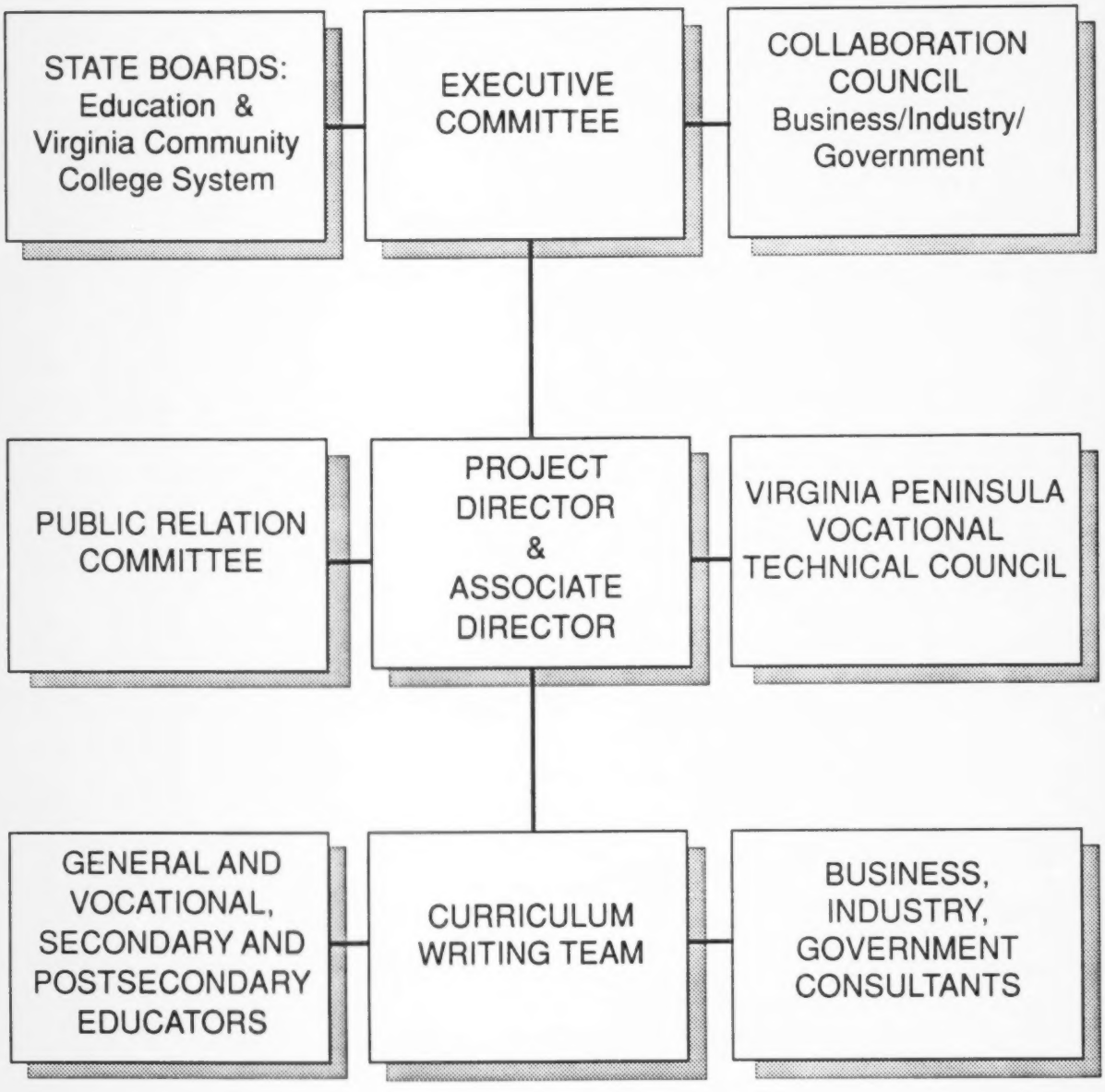
APPENDIX C

Examples of Organizational Structures

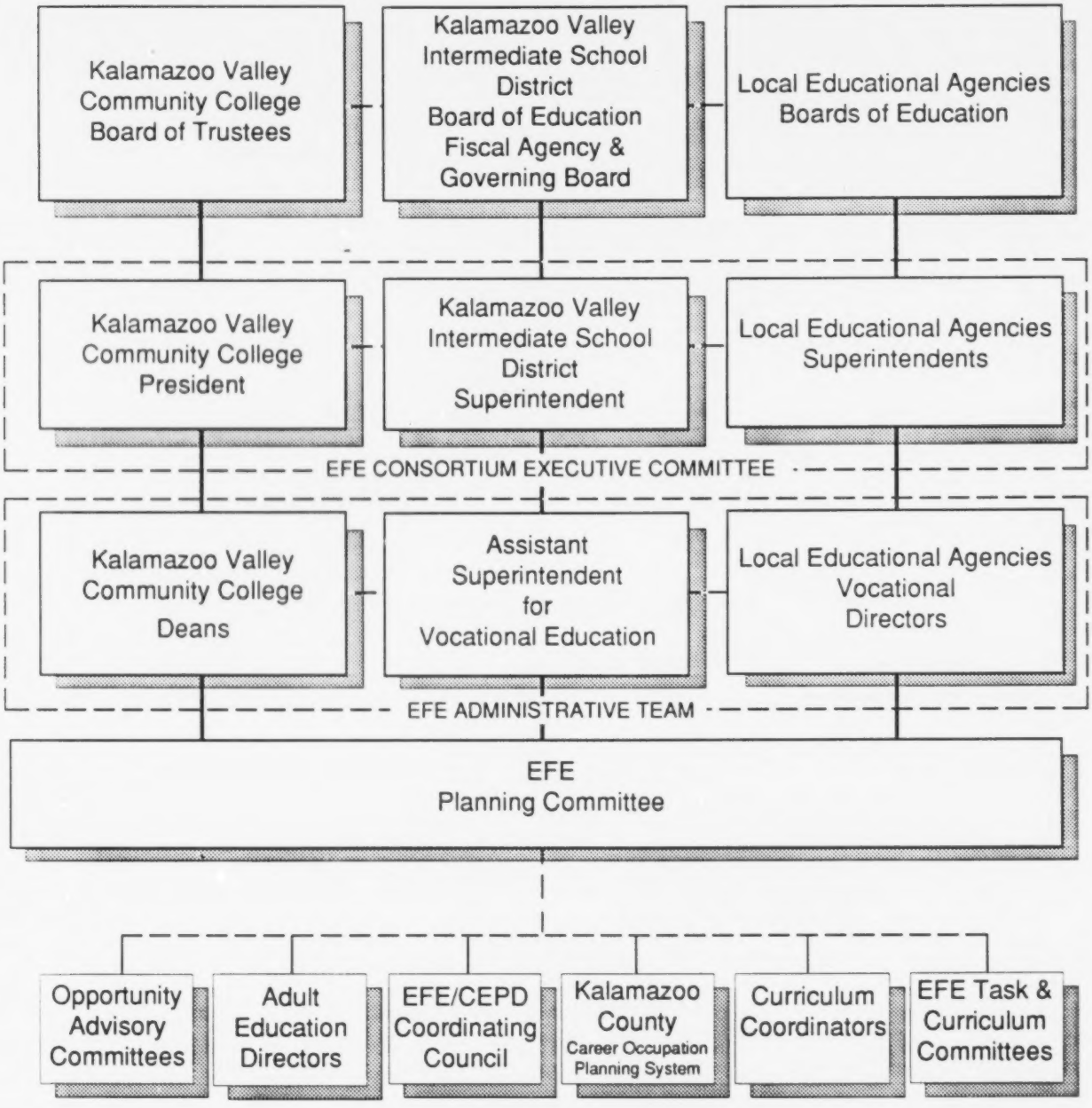
OAKLAND COUNTY TECH PREP 2+2 PROGRAM



VIRGINIA PENINSULA PROJECT
MASTER TECHNICIAN
Organizational Chart


STATE BOARDS: Education & Virginia Community College System
EXECUTIVE COMMITTEE
COLLABORATION COUNCIL Business/Industry/ Government
PUBLIC RELATION COMMITTEE
PROJECT DIRECTOR & ASSOCIATE DIRECTOR
VIRGINIA PENINSULA VOCATIONAL TECHNICAL COUNCIL
GENERAL AND VOCATIONAL, SECONDARY AND POSTSECONDARY EDUCATORS
CURRICULUM WRITING TEAM
BUSINESS, INDUSTRY, GOVERNMENT CONSULTANTS

KALAMAZOO VALLEY CONSORTIUM
EDUCATION FOR EMPLOYMENT


Kalamazoo Valley Community College Board of Trustees
Kalamazoo Valley Intermediate School District Board of Education Fiscal Agency & Governing Board
Local Educational Agencies Boards of Education
Kalamazoo Valley Community College President
Kalamazoo Valley Intermediate School District Superintendent
Local Educational Agencies Superintendents
EFE CONSORTIUM EXECUTIVE COMMITTEE
Kalamazoo Valley Community College Deans
Assistant Superintendent for Vocational Education
Local Educational Agencies Vocational Directors
EFE ADMINISTRATIVE TEAM
EFE Planning Committee
Opportunity Advisory Committees
Adult Education Directors
EFE/CEPD Coordinating Council
Kalamazoo County Career Occupation Planning System
Curriculum Coordinators
EFE Task & Curriculum Committees

APPENDIX D

Examples of three Associate Degree programs and the related high school and college curricula. Taken from the Hillsboro & Glencoe High Schools and Portland Community College "2 + 2 Tech Prep Guide", 1987.

2 + 2 TECH PREP ASSOCIATE DEGREE
ELECTRONIC ENGINEERING TECHNOLOGY

A 2 + 2 Tech Prep Associate Degree program ties together grades 11-14 in a continuous succession of courses. The associate degree is typically earned by completing 2 years of designated college courses after graduating from high school. By participating in the 2 + 2 Tech Prep Program, the student is not only certain to have met all of the community college's prerequisites, but may also be able to challenge and earn some of the associate degree credits while still in high school.

Challenge Credits - High school courses which may be taken to challenge and earn associate degree credits are shown below in bold type. The related college courses are also in bold type. High school students should consult with their counselor or teacher to find out how to earn challenge credits.

Required Courses - The 11th and 12th grade required courses to earn a high school diploma are the same for every student.

Elective Courses - The elective high school courses for this 2 + 2 Tech Prep program are recommended for providing the student with the best technical preparation for the given associate degree program. Students may choose to exceed or differ from what is recommended.

Changing or Exiting the Program - Flexibility and individual choice is guaranteed and easy to attain with the 2 + 2 Tech Prep Associate's Degree program. Students may enter, exit, or change programs at any time. For many programs there are 3 possible "termination" exit points which will prepare the student with some entry-level job skills and credentials: 1) grade 12 - high school diploma; 2) grade 13 - Vocational Certificate; 3) grade 14 - Associate Degree. See the following page for more information.

2 YEARS + 2 YEARS

HIGH SCHOOL — COMMUNITY COLLEGE

GRADE 11

SEMESTER 1

Required Course	Credit
English	.5
U.S. History	.5
Personal Finance	.5

Elective Course	Credit
Technical Math	.5
Electronics II	.5
Principles Tech/Physics	.5

SEMESTER 2

Required Course	Credit
English	.5
U.S. History	.5
Health	.5

Elective Course	Credit
Technical Math	.5
Electronics II	.5
Principles Tech/Physics	.5
TOTAL	6.0

GRADE 12

Required Course	Credit
English	.5
Economics	.5

Elective Course	Credit
Analysis	.5
Electronics III	.5
PASCAL I	.5
Mechanical Drafting II	.5

Required Course	Credit
English	.5
Social Studies	.5

Elective Course	Credit
Analysis	.5
Electronics III	.5
PASCAL II	.5
Mechanical Drafting II	.5
TOTAL	6.0

GRADE 13

First Term

Title	Cr.
Program for Electronics	3
Electronic Circ/Dev. I	4
Digital Systems I	4
College Algebra	4
English Composition	3
TOTAL	18

Second Term

Title	Cr.
Electronic Cir/Dev. II	4
Digital Systems II	4
Trigonometry	4
English Composition	3
General Education	3
TOTAL	18

Third Term

Title	Cr.
Electronic Cir/Dev III	4
Digital Systems III	4
Calculus for Electronics	4
Software Programming I	4
Technical Writing I	3
TOTAL	19

GRADE 14

Fourth Term

Title	Cr.
Microcomputer Syst. I	4
Linear Systems I	4
RF Comm. Systems	4
Seminar I	1
Elective	4
TOTAL	17

Fifth Term

Title	Cr.
Microcomputer Syst. II	4
Linear Systems II	4
Seminar II	1
General Physics I	4
Elective	4
TOTAL	17

Sixth Term

Title	Cr.
Microcomputer Syst. III	4
Power Electronics	4
Unix and C Comp Lang.	4
General Physics II	4
TOTAL	16

ELECTRONIC ENGINEERING TECHNOLOGY (AAS)

This two-year Associate of Applied Science (AAS) degree will prepare an individual to become an Electronic or Electrical Technician. Internships are available with local manufacturing industries. One may also transfer, after this two-year program is completed, to the Oregon Institute of Technology, with junior standing.

ENTRY-LEVEL JOBS: Communications, Tests and Measurements, Computers, or Biomedical Instrumentation

GENERAL DUTIES: To assist in manufacturing of electronic products: Troubleshoot, calibrate, test and repair electronic components and circuit boards used in products such as computers, instruments and calculators; use information from circuit diagrams to test, adjust, inspect products to ensure that standards/specifications are met; may help in the development of new electronic products; and repair and service defective equipment.

JOB OUTLOOK: There is presently a surplus of entry-level technicians, but the outlook is expected to improve. Knowledge of computer programming is needed in some situations to work with software-driven equipment.

SALARY RANGE: $1,300 to $2,100 /month

HIGH SCHOOL ELECTIVES: Technical Math - 36 weeks, 1.0 credit; Emphasis on technical problems using fundamentals of algebra and geometry; develop speed and accuracy in manipulative operations; introduction/application of trigonometry using calculators for problem solving.

Electronic II - 36 weeks, 1.0 credit
AC, DC and semiconductor fundamentals; theory and operation of passive circuits; basic troubleshooting procedures; use of oscilloscope, audio generator, power supply, VOM meter and other electronic equipment.

Principles of Technology - 36 weeks, 1.0 credit
Real applications of physics to modern technology; six major principles; force, work, rate, resistance, energy and power are applied to four high-tech systems; mechanical, fluid, thermal, and electrical.

Analysis - 36 weeks, 1.0 credit
Pre-calculus course - theory of equations, vectors, trigonometry, complex numbers, conic sections, curve sketching and matrices; some computer technique exploration.

Electronics III - 36 weeks, 1.0 credit
Basic circuit and analysis techniques; power supply circuits; electronic applications projects; digital logic fundamental; microprocessor systems.

Mechanical Drafting II - 36 weeks, 1.0 credit
Basic drawing skills/methods; perspective; geometric constructions; computer-aided drafting (CAD); multiview projection; isometric; oblique; sectioning; shop processes; lettering; dimensioning.

PASCAL I - 18 weeks, .5 credit
Principles/concepts of computer programming using PASCAL; problem solving, designing, coding and documenting programs.

PASCAL II - 18 weeks, .5 credit
Advanced programming; parameters, functions, data types, arrays, and records.
Consult your high school curriculum handbook for more information.

FIRST TERM COLLEGE COURSES:

EET 110 Programming for Electronics
3 credits
Introduction to BASIC, including developing, debugging and documenting programs, with applications to electronics. Use of commercial software included.

EET 111 Electronic Circuits and Devices I
4 credits
Introduction to electrical circuit components and basic circuit analysis techniques, including Ohm's Law, Kirchoff's, and network reduction theorems applied to DC circuits. Time domain AC signals will be introduced.

MTH 101 College Algebra
4 credits
Relations of one and two variables with emphasis on polynomial, rational, exponential and logarithmic functions; conic sections; series; sequences; complex numbers and matrices.

WR 121 English Composition
3 credits
Expository writing skills, reading skills; study of prose models.

Contact Portland Community College for more information.

2 + 2 TECH PREP ASSOCIATE DEGREE
BUSINESS MANAGEMENT (AAS)

A 2 + 2 Tech Prep Associate Degree program ties together grades 11-14 in a continuous succession of courses. The associate degree is typically earned by completing 2 years of designated college courses after graduating from high school. By participating in the 2 + 2 Tech Prep Program, the student is not only certain to have met all of the community college's prerequisites, but may also be able to challenge and earn some of the associate degree credits while still in high school.

Challenge Credits - High school courses which may be taken to challenge and earn associate degree credits are shown below in bold type. The related college courses are also in bold type. High school students should consult with their counselor or teacher to find out how to earn challenge credits.

Required Courses - The 11th and 12th grade required courses to earn a high school diploma are the same for every student.

Elective Courses - The elective high school courses for this 2 + 2 Tech Prep program are recommended for providing the student with the best technical preparation for the given associate degree program. Students may choose to exceed or differ from what is recommended.

Changing or Exiting the Program - Flexibility and individual choice is guaranteed and easy to attain with the 2 + 2 Tech Prep Associate's Degree program. Students may enter, exit, or change programs at any time. For many programs there are 3 possible "termination" exit points which will prepare the student with some entry-level job skills and credentials: 1) grade 12 - high school diploma; 2) grade 13 - Vocational Certificate; 3) grade 14 - Associate Degree. See the following page for more information.

2 YEARS + 2 YEARS

HIGH SCHOOL

GRADE 11

SEMESTER 1

Required Course	Credit
English	.5
U.S. History	.5
Personal Finance	.5
Elective Course	**Credit**
Technical Math	.5
Accounting I	.5
Physical Science	.5

SEMESTER 2

Required Course	Credit
English	.5
U.S. History	.5
Health	.5
Elective Course	**Credit**
Consumer Math	.5
Accounting I	.5
Physical Science	.5
TOTAL	6.0

GRADE 12

Required Course	Credit
English	.5
Economics	.5
Elective Course	**Credit**
Algebra I	.5
Accounting II	.5
Automation Bus. Lab.	.5
Marketing I	.5

Required Course	Credit
English	.5
Social Studies	.5
Elective Course	**Credit**
Algebra I	.5
Accounting II	.5
Automation Bus. Lab.	.5
Marketing I	.5
TOTAL	6.0

COMMUNITY COLLEGE

GRADE 13

First Term

Course #	Title	Cr.
BA 101	Intro to Business	4
PCM 30	Business Math I	4
BUS 201	**Introduction to Acct.**	3
OA 121	**Typing I**	3
WR 121	English Composition	3
	TOTAL	17

Second Term

Course #	Title	Cr.
BA 206	Mgmt. Fundamentals	3
BA 211	Principles of Acct	3
BA 238	Sales	3
OA 220	Bus.Mach/Calc.	3
WR 214	Business Comm II	3
	TOTAL	15

Third Term

Course #	Title	Cr.
BA 203	Intro Intermed Bus	3
BA 212	Principles/Acct. II	3
BA 226	Business Law	3
BA 244	Intro Record Mgmt.	3
BA 250	Small Bus. Mgmt.	3
	TOTAL	15

GRADE 14

Fourth Term

Course #	Title	Cr.
BA 223	Principles/Marketing	3
EC 201	Princ./Econ:Intro/Phil.	3
	Elective	3
	General Education	6
	TOTAL	15

Fifth Term

Course #	Title	Cr.
BA 111	Principles/Marketing	4
BA 113	Credit Procedures	3
BA 213	Principles of Acct III	3
BA 241	Risk/Insurance	3
	Elective	3
	TOTAL	16

Sixth Term

Course #	Title	Cr.
BA 209	Acct. App.(Microcomp)	3
BA 222	Finance	3
BA 251	Office Mgmt.	3
BA 285	Business Relations	3
	General Education	6
	TOTAL	18

BUSINESS MANAGEMENT (AAS)

This two-year Associate of Applied Science (AAS) degree will prepare an individual to enter business as a supervisory trainee who will coordinate activities and direct personnel to achieve the goals of the company.

ENTRY-LEVEL JOBS: Merchandise Manager, Store Manager, Office Manager, Small Business Manager, Management Trainee (supervisory)

GENERAL JOB DUTIES: Assign duties to workers, establish work schedules, may evaluate worker performance, may recommend hiring, promotions, and dismissals, organize systems to reach company goals

JOB OUTLOOK: Varies according to type of organization

SALARY RANGE: Merchandise Manager- $6.13/hr., Store Manager-$907 /mo., Auto Service Dept Manager-$1206 /mo., Parts Department Manager-$6.50/hr.$1,300 to $2,100 /month

HIGH SCHOOL ELECTIVES:

Consumer Math - 36 weeks, 1.0 credit
Wages, commissions, money borrowing, interests, expenses, taxes, insurance.

Accounting I - 36 weeks, 1.0 credit
Basic accounting principles and procedures; profit and loss; asset and cash management; payables and receivables, bookkeeping; tax preparation; payroll.

Physical Science - 36 weeks, 1.0 credit
Practical understanding of some of the fundamentals of physics and chemistry; energy and the environment; chemical reactions; applications of motion, heat, light, sound, and electricity; forces of nature; basic machines.

Algebra I - 36 weeks, 1.0 credit
Structure of math analytical relationships; fundamentals operations with algebraic terms exponents and equations.

Accounting II - 36 weeks, 1.0 credit
Advanced accounting principles and practices; simulated accounting operations; cost accounting; introductory automated accounting systems; 10 key touch skills.

Automated Office Business Lab - 36 weeks, 1.0 credits
Information processing and office communications; word processing; electronic spreadsheet; database management; data entry; electronic mail; machine transcription; electronic 10 key calculator; computerized payroll.

Marketing I - 36 weeks, 1.0 credit
General marketing, merchandising, and retail sales; operation a retail business; advertising; promotion and selling strategies; business organization and management.

Consult your high school curriculum handbook for more information.

BA 101 Introduction to Business
4 credits
Business environment, management, organization, marketing, finance, accounting, and data processing.

PCM 30 Business Math I
4 credits
Interest, payroll, pricing, invoicing, trade discounts, taxes, report analysis, depreciation, and insurance.

BUS 201 Intro to Accounting
3 credits
Double-entry bookkeeping as related to businesses - general ledger; payroll; pettycash/bank reconciliations; worksheets; financial statements.

QA 121 Typing I
3 credits
Touch system instruction, including setting up and typing simple tables, letters and manuscripts. Self-paced course.

WR 121 English Composition
3 credits
Expository writing skills, reading skills; study of prose models.

Contact Portland Community College for more information.

2 + 2 TECH PREP ASSOCIATE DEGREE
MEDICAL LABORATORY TECHNOLOGY(AAS)

A 2 + 2 Tech Prep Associate Degree program ties together grades 11-14 in a continuous succession of courses. The associate degree is typically earned by completing 2 years of designated college courses after graduating from high school. By participating in the 2 + 2 Tech Prep Program, the student is not only certain to have met all of the community college's prerequisites, but may also be able to challenge and earn some of the associate degree credits while still in high school.

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Elective Courses - The elective high school courses for this 2 + 2 Tech Prep program are recommended for providing the student with the best technical preparation for the given associate degree program. Students may choose to exceed or differ from what is recommended.

Changing or Exiting the Program - Flexibility and individual choice is guaranteed and easy to attain with the 2 + 2 Tech Prep Associate's Degree program. Students may enter, exit, or change programs at any time. For many programs there are 3 possible "termination" exit points which will prepare the student with some entry-level job skills and credentials: 1) grade 12 - high school diploma; 2) grade 13 - Vocational Certificate; 3) grade 14 - Associate Degree. See the following page for more information.

2 YEARS + 2 YEARS

HIGH SCHOOL

GRADE 11

SEMESTER 1

Required Course	Credit
English	.5
U.S. History	.5
Personal Finance	.5
Elective Course	**Credit**
Algebra I	.5
Health Occupations	1.0

SEMESTER 2

Required Course	Credit
English	.5
U.S. History	.5
Health	.5
Elective Course	**Credit**
Algebra I	.5
Health Occupations	1.0
TOTAL	6.0

GRADE 12

SEMESTER 1

Required Course	Credit
English	.5
Economics	.5
Elective Course	**Credit**
Geometry	.5
Chemistry	.5
Indep. stud. Bus. Lab.	.5
Sociology	.5

SEMESTER 2

Required Course	Credit
English	.5
Social Studies	.5
Elective Course	**Credit**
Geometry	.5
Chemistry	.5
Indep. stud. Bus. Lab.	.5
Psychology	.5
TOTAL	6.0

COMMUNITY COLLEGE

GRADE 13

First Term

Course #	Title	Cr.
ZOO 201	Zoology	4
CH 105	General Chem(all. Hea.)	5
MLT 105	Medical Term. I	4
	General Education	3
	TOTAL	16

Second Term

Course #	Title	Cr.
CH 106	General Chem(All. Hea.)	5
MLT 110	Medical Term. II	4
	General Education	3
ZOO 202	Zoology	4
	TOTAL	16

Third Term

Course #	Title	Cr.
ZOO 203	Zoology	4
BI 234	Microbiology	4
	General Education	6
	TOTAL	14

Fourth Term

Course #	Title	Cr.
MLT 201	Clinical Chemistry I	3
MLT 210	Hematology	3
MLT 220	Bacteriology I	3
MLT 240	Immunohematology	3
MLT 250	Clinical Lab. Pract. I	3
	TOTAL	15

GRADE 14

Fifth Term

Course #	Title	Cr.
MLT202	Clinical Chemistry II	3
MLT222	Bacteriology II	3
MLT242	Immunohematology II	3
MLT252	Clinical Lab Pract II	3
	Elective	4
	TOTAL	15

Sixth Term

Course #	Title	Cr.
MLT 203	Clinical Chemistry III	3
MLT 208	Medical Parasitology	3
MLT 215	Medical Mycology	2
MLT 101	Routine Analysis	2
MLT 254	Clinical Lab Pract III	3
	General Education	3
	TOTAL	16

Seventh Term

Course #	Title	Cr.
MLT 260	Clinical Seminar	4
MLT 256	Clinical Lab Pract IV	8
	TOTAL	12

MEDICAL LABORATORY TECHNOLOGY (AAS)

This two-year Associate of Applied Science (AAS) degree will prepare an individual to take Oregon's Certification exam and become a medical laboratory technician. There is limited enrollment in this program; participation is competitive.

ENTRY-LEVEL JOBS:
Medical Laboratory Technician

GENERAL DUTIES:
Perform routine clinical laboratory testing procedures to provide scientific information needed in diagnosis, prognosis and treatment of disease:

- Identify normal and abnormal blood cells
- Determine diabetic and hypoglycemic blood glucose levels
- Identify bacterial, fungal and parasitic infectious agents
- Use sophisticated instruments
- Function under the supervision of qualified medical technologists and pathologists

JOB OUTLOOK: Fairly good.

SALARY RANGE: $6.00 to $8.80/hr.

HIGH SCHOOL ELECTIVES:

Algebra I - 36 weeks, 1.0 credit
Structure of math analytical relationships; fundamentals operations with algebraic terms exponents and equations.

Health Occupations - 36 weeks, 2.0 credits
Broad classroom training and clinical experiences in health care - hospitals, convalescent care centers, medical and dental clinics; study of anatomy, physiology, terminology, disease, and general health care procedures.

Geometry - 36 weeks, 1.0 credit
Logical thinking and reasoning skills; practical measurement through study of plane figures, i.e. triangles, circles and parallelograms.

Chemistry - 36 weeks, 1.0 credit
Fundamentals of chemistry - atomic theory, chemical bonding, and molecular interaction; laboratory skills and techniques for conducting and interpreting experiments.

Independent Study Business Lab - 36, 1.0 credit
Self-paced instructional modules in computer business applications - accounting, word processing, database management, electronic spreadsheet, data entry, computer graphics, business simulations.

Sociology - 18 weeks, .5 credit
Study of human and social behaviors - structure of society; basic institutions; social classes; social change; current social problems.

Psychology - 18 weeks, .5 credit
Study of human behavior - feelings; stress, relationships; mental illness; therapy; personality; other behaviors.

FIRST TERM COLLEGE COURSES:

ZOO 201 Zoology 4 credits
Survey of the animal kingdom, emphasizing the morphology, physiology, embryology, and evolution of animals.

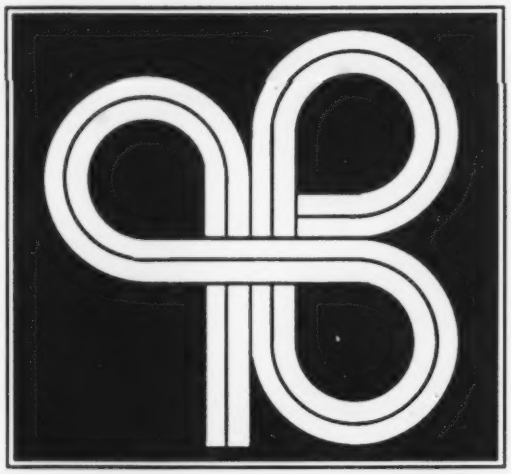
CH 105 General Chemistry(Allied Health) 5 credits
Basics of Chemistry.

MLT 105 Medical Technology I 4 credits
Introduction to clinical laboratory science; use and care of lab glassware, supplies and equipment, quality control, lab math, and statistics used in laboratory setting; basic hematology and urinalysis.

Contact Portland Community College for more information..

APPENDIX E

Agenda of "Continuity of Learning" Conference.



TECH PREP
PARTNERSHIPS

"Continuity of Learning"

C O N F E R E N C E

A Conference for Michigan High School and Community College Educators, Counselors, Administrators and School Board Members.

This conference is co-sponsored by the State Board of Education.

May 19-20, 1988

Schoolcraft College & Holiday Inn Holidome
Livonia, Michigan

Moderator - ***Dr. Louis A. Reibling***, Dean of Instruction, Schoolcraft College

THURSDAY - MAY 19

11:00 - 12:00 **REGISTRATION**

12:00 - 1:15 **OPENING LUNCHEON** - Plantation Ballroom A & B

Opening Remarks and Welcome - *Dr. Richard W. McDowell*, President, Schoolcraft College.

KEYNOTE SPEAKER - *Dr. James F. McKenney*, Associate Director of Keep America Working Project (KAW), American Association of Community and Junior Colleges, Washington, D.C. *"Education For Tomorrow's Workforce"*.

"Introduction of Task Force and Presenters" - Dr. Susan W. Cameron, Tech Prep Project Manager.

"Tech Prep Task Force Recommendations" - *Dr. Clyde LeTarte*, President, Jackson Community College, and Chair, Tech Prep Task Force Leadership Committee.
Introduction - *William Shade*, Affirmative Action Officer, Michigan Department of State, Tech Prep Task Force Member.

2:15 - 3:30 **BREAKOUT SESSIONS A** - (choose one)

"2+2 Tech Prep, A Collaboration Between Lansing Community College and Lansing School District" - Colony Conference Room

Bill Denardo, Program Director, Technical Education, Lansing Community College and *Jody Bennett*, Special Projects Coordinator, Lansing School District.
Introduction - *Dorothy Mirkil*, Nursing Instructor, Lansing Community College, Tech Prep Task Force Member.

"Business Needs for the Nineties" - Plantation Ballroom A

Dr. James Jacobs, Director, Michigan Community College Liaison Office, Industrial Technology Institute, Ann Arbor, Michigan.
Introduction - *James Folkening*, Supervisor, Michigan Department of Education, Higher Education Management Services.

"Kalamazoo Valley Consortium/Education for Employment: K-14 Program that Responds to the Technological Needs of Our Society" - Plantation Ballroom C 2

Irv Cumming, Assistant Superintendent, Vocational Education, Kalamazoo Valley Intermediate School District, Tech Prep Task Force Member, and *Larry Rouse*, Technology Education Implementer, Portage Public Schools.
Introduction - *Virgil Hillstead*, Director of Guidance Assessment and Placement, Kalamazoo Valley Community College, Tech Prep Task Force Member.

"The Initial Stages - Planning for Tech Prep" - Executive Board Room

Dick Thompson, Vice President, Academic and Student Affairs, Oakland Community College.
Introduction - *Robert A. Crowe*, Secondary Vocational Education Administrator, Lamphere High School, Tech Prep Task Force Member.

"Career/Tech Prep 4+2, Counseling, Guidance, and Placement, Southwestern Michigan College and Lewis Cass Intermediate School District" - Plantation Room B

Dr. Norman C. Ashcraft, Dean, School of Technology, Southwestern Michigan College, and *Ned Sutherland*, Director of Career and Vocational Education, Lewis Cass Intermediate School District.
Introduction - *Quill Pettway*, Program Chair, Manufacturing Technology, Wayne County Community College, Tech Prep Task Force Member.

3:30 - 3:45 **REFRESHMENT BREAK**

3:45 - 5:00 **BREAKOUT SESSIONS B** - (choose one)

Repeat Session A - "2+2 Tech Prep, A Collaboration Between Lansing Community College and Lansing School District" - Colony Conference Room

"The Ionia - Montcalm Project" - Plantation Ballroom A

Jesse Fox, Technology Dean, Montcalm Community College, and *Sandra Dupuis*, Vocational Education Director, Ionia Public Schools.
Introduction - *Nancy Drummond*, Business Division Chairperson, Delta College, Tech Prep Task Force Member.

Repeat Session A - "Kalamazoo Valley Consortium/Education for Employment: K-14 Program that Responds to the Technological Needs of Our Society" - Plantation Ballroom C 2

"Academics and Vocational Education" - Executive Board Room

Russ Maples, Director of Adult & Vocational Education, Lansing Community College.
Introduction - *Jack Smith*, Consultant, Vocational Education Service, Michigan Department of Education.

Repeat Session A - "Career/Tech Prep 4+2, Counseling, Guidance, and Placement, Southwestern Michigan College and Lewis Cass Intermediate School District" - Plantation Ballroom B

5:30 - 6:30 **HORS D'OEUVRES & CASH BAR** - The Holidome Poolside

7:00 - 9:30 **DINNER** - Schoolcraft College, Waterman Center
(a Schoolcraft shuttle van is available for transportation)

Keynote Speaker - *Dr. Donald C. Garrison*, President, Tri-County Technical College, Pendleton, South Carolina, "2+2 - *Tech Prep, The National Picture*".
Introduction - *Ronald Root*, Director, Michigan Department of Education, Higher Education Management Services.

FRIDAY - MAY 20

7:15 - 8:00 **AEROBICS WORKOUT** - *Maureen Hughes*, Instructor, Holidome Lounge area

8:00 - 9:00 **CONTINENTAL BREAKFAST** - Plantation Ballroom A & B

9:00 - 9:15 **Introduction of Friday's Presenters** - *Dr. Susan W. Cameron*, Project Manager

9:15 - 9:30 **WELCOME** - *Gary Hawks*, Interim Superintendent of Public Instruction, Department of Education.

9:30 - 10:45 **BREAKOUT SESSIONS C** - (choose one)

"Dreamers: Learning Against the Odds" - a WDIV–TV4 Documentary - Plantation Ballroom C

Tom LoCicero, Senior Producer for Public Affairs, WDIV–TV4.
Introduction - *Maureen Neal*, Consultant, Community College Services Unit, Department of Education.

Repeat Session A - "Business Needs for the Nineties" - Plantation Ballroom A

"Yooper Prep/Northern Michigan University, Marquette ISD" - Plantation Ballroom B

Dr. Jim Suksi, Dean of the School of Technology & Applied Sciences, Northern Michigan University, and *Tom Pierson*, Director of Vocational-Technical Education, Marquette - Alger ISD.
Introduction - *Julie Walker*, Director, Vocational Education, Saginaw Public Schools, Tech Prep Task Force Member.

"The Alliance: A Partnership of Industry & Public Education" - Executive Board Room

Dr. Edith Jacques, Dean of Continuing Education, Washtenaw Community College and *Brenda Griffith*, Coordinator of the Learning Center, Ypsilanti Public Schools.
Introduction - *Denise Sigworth*, Director of Grants & Institutional Research, Schoolcraft College.

"Tech Prep - Opportunities for Change" - Colonial Conference Room

Dr. Till Peters, Dean of Occupational Education,Grand Rapids Junior College and *Barry Boyer*, Supervisor of Industrial Arts and Technical Education, Grand Rapids Public Schools.
Introduction - *James Pintar*, President, Michigan Council on Vocational Education, Tech Prep Task Force Member.

10:45 - 11:00 **REFRESHMENT BREAK**

11:00 - 12:15 **BREAKOUT SESSIONS D** - (choose one)

Repeat Session B - "Dreamers: Learning Against the Odds" - a WDIV–TV4 Documentary - Plantation Ballroom C

Repeat Session C - "Yooper Prep/Northern Michigan University, Marquette ISD" - Plantation Ballroom B

Repeat Session B - "Academics and Vocational Education" - Executive Board Room

"Partnerships for Education" - Colonial Conference Rooms

Elaine Gordon, Coordinator, Michigan Department of Education and *Marilyn Goodsman*, Communications & Partnership Director, Brighton Area Public Schools.
Introduction - *Dr. Susan Cameron*, Tech Prep Project Manager.

12:15 - 1:45 **LUNCHEON AND SPEAKER** - Holidome Poolside

Introduction of Speaker - *Denise Sigworth*, Director of Grants & Institutional Research, Schoolcraft College.

Speaker - *Mr. Daniel Russie*, Assistant Controller, Maccabees Mutual Life Insurance Co. - "*Workplace of the Future*".

APPENDIX F

TASK FORCE GENERAL MEETINGS: AGENDAS AND MINUTES

STATE-WIDE TASK FORCE ON TECHNICAL PREPARATION FOR MASTER TECHNICIAN STATUS

AGENDA

Friday, December 4, 1987
Liberal Arts B 200

8:30 - 9:30 Registration

9:30 - 10:45 Dr. Richard W. McDowell, President, Schoolcraft College

Setting the context: Dr. James Jacobs
Director Liaison Office Industrial Technology Institute

Michigan Department of Education Role:
James Folkening
Supervisor Community College Service Unit

An Overview of Project Planning:
Dr. Susan W. Cameron, Project Manager
Schoolcraft College

Kalamazoo Valley Consortium/Education for Employment:
Larry Rouse
Technology Education Consultant Portage Public Schools

10:45 -10:55 Break (move into subcommittees)
Subcommittee meetings:
Leadership: Clyde LeTarte - Chair
Guidance/Counseling: Virgil Hillstead, William Shade - Co-chairs
Curriculum: Nancy Drummond, Julie Walker - Co-chair

10:55 -11:45 Select recorder in each group

Topics: Brainstorming

1. What would a "Tech Prep" program look like at your institution from your role perspective?
2. What resources will you need to make your subcommittee effective?

11:45 -12:45 Join back in large group:

Each subgroup share components and merge ideas.

12:15 -12:30 Next steps: Future meetings

12:30 - Lunch in Waterman Center (with subcommittees)

MISSION: To provide for the development of models for the Tech-Prep 2+2 concepts, including:

(1) identification of previous research
(2) identification of competencies (preparation)
(3) identification of guidance (components)
(4) recommend delivery systems

CHARGE:

(1) review literature and interview findings
(2) review State and National models
(3) identify and recommend competencies:

Mathematics Communications
Sciences Computers

(4) recommend delivery mechanisms for youth and adults

MINUTES OF THE MEETING OF THE STATE-WIDE TASK FORCE ON TECHNICAL PREPARATION FOR MASTER TECHNICIAN STATUS

The first meeting of the Task Force on Technical Preparation for Master Technician Status was held at Schoolcraft College on Friday morning, December 4, 1987. At 9:40 a.m. Dr. Richard McDowell, President of Schoolcraft College greeted the group with a word of welcome and extended his thanks and appreciation for the members agreeing to serve on the Tech-Prep Task Force.

PRESENT:
S. Cameron, R. Crowe, I. Cumming, N. Drummond, V. Hillstead, J. Jacobs, M. Krnacik, C. LeTarte, M. Johnson, R. Larson, F. Mead, D. Mirkil, M.Neal, Q. Pettway, J. Pintar, L. Reibling, L. Rouse, V. Seshardri, D. Sigworth, D. Small, J. Walker, C. Warner.

ABSENT:
S. Chaplin, L. Estrada, J. Rose, W. Shade, B. Hauser, A. Winston

Michigan Department of Education Role:

James Folkening was scheduled to explain the role of the Michigan Department of Education, but due to illness was unable to attend, Maureen Neal stepped in for him. She distributed an outline entitled *Concept Paper on Technical Preparation for Youth and Adults into Occupational Education Programs at Community Colleges.* Briefly explaining the outline, she emphasized that one model will not work for the whole state of Michigan. Different types of partnerships will be needed. She also added that this project will not be completed by the end of the year, but encouraged the group to accomplish as much as time permits.

Setting the Context:

Dr. James Jacobs, Director from the Industrial Technology Institute explained how the state of Michigan heavily depends on manufacturing and how that base is in trouble. He pointed out a document written in 1984 (Michigan Department of Commerce: *Path the Prosperity*) which explains three alternatives for the existing skill level; to learn technical skills and basic skills of present jobs. There is also a need to look at major manufacturing facilities to determine who their workers are, and what their educational level is. A major question is whether technology drives the skill base or whether the skill base drives the technology. If the skill base comes first, then technology is adapted by firms, training needs determined based on prior available skill base. Tech-Prep can alter the pre-existing skill base for youth and re-train to another skill base for adults.

Overview of the Project Planning

Dr. Susan Cameron, Project manager, outlined a Strategic Planning Framework which the Task Force is following for planning purposes. Tasks accomplished are: Organizing (i.e. Task Force and Project Office), Scanning Environment (i.e. *The Neglected Majority*, Project Research, Local, National Visits) Select Key Issue(s) (i.e. Response to a high-tech job environment: Tech-Prep) Develop Mission Statement: (i.e. Gary Hawks letter of 7/7/87).

The next planning step is Conduct Internal and External Analyses. This task is now before the sub-committee to be carried out in the first five months of 1988. More direction will emerge in the sub-committees.

Susan outlined components of two national models. She briefly explained the topics to be discussed in the three subcommittees and gave instructions on what she hoped they could accomplish for the day. Debra Small was asked to read the Mission statement from the Task Force on Technical Preparation handout.

A Michigan Model

Larry Rouse, Technology Education Consultant for Portage Public Schools showed several overheads on their program, Education for Employment. He also gave the group several terms to think about, asking them to define the terms technology and technical as they refer to education.

Subcommittees: Policy, Curriculum and Counseling

One goal of each sub-committee was to brainstorm components, in a general way, of an ideal technical preparation program. What should they include:

Summary of Components from all subcommittees:

A. State Board of Education/Project Role:
   1. Pilot Projects:
      a. How inclusive
      b. How diverse
      c. Variety of providers
   2. What role for ISD
   3. Time frame for:
      a. implementation
      b. pilot selection
      c. all programs
   4. Funding/Budget
   5. State Role/Local Role
   6. Board Policy Statement

B. Faculty/Staff
   1. Keep informed
   2. Inclusion in Planning
   3. Development:
      a. visit other Tech-Prep Programs
      b. workshops/seminars
      c. participation of Faculty
      d. staff exchange (Business)

C. Curriculum/Instruction
   1. Define Tech-Prep
   2. Co-op Education
   3. Continuing Education/Training (Adults)
   4. Identify Target populations
   5. Develop Communication between High Schools and Community Colleges.
   6. Priority on Problem-solving skills.

D. Counseling: Student support, selection.
   1. Sex equity issues
   2. Minority access/success
   3. Drop-out problem
   4. Access criteria
   5. Success criteria
   6. At risk youth

E. Involvement of External Environment
   1. Business/Industry/Community: Cooperation and Consultants
   2. Government: Advisory/Consultants

F. Dissemination
   1. Management Plan:
      a. goals
      b. activities
      c. products
   2. Acceptance of Policy
   3. Public Relations State-wide

TECH PREP TASK FORCE AGENDA
FEBRUARY 26, ITI-ANN ARBOR
WORKING SESSION: TASKS FOR SUBCOMMITTEES

LEADERSHIP

A. Identify essential components of leader support necessary for Tech Prep partnership formation and program success.

B. Ideas about dissemination of information related to Tech Prep in Michigan.
   1. Tech Prep Information brochure.
   2. May conference at Schoolcraft College and brochure.
   3. Video?
   4. Regional inservice workshop?

GUIDANCE

A. Identify various models of Tech Prep guidance programs.
B. Identify essential components of future/counseling for Tech Prep program.

Essential elements for a Tech Prep guidance program identified at February 10th meeting.

1. Career awareness/exploration
2. Education development plan
3. Selection criteria
4. Recruitment
5. Program placement
6. Job opportunity an placement

CURRICULUM

A. Review and refine definition and statement about Tech Prep.
B. Identify basic and technical competencies for technical preparation program.

Addendum: Co-op Model:

A program which includes co-op experiences specific to the students chosen technical program. Relationship with business and industry for progressive co-op experience are basic to this model.

TASK FORCE MEETING ON TECH PREP
MEETING MINUTES
February 26, 1988, ITI-Ann Arbor

Present: Clyde LeTarte, Chair, Irv Cumming, Jim Pintar, Frank Mead, Zane Stein, Jack Smith, Nancy Drummond, Julie Walker, Marvin Johnson, Mildred Krnacik, Ray Lawson, Vasu Seshadri, Chuck Warner, Virgil Hillstead, William Shade, Robert Crowe, Dorothy Mirkil, Quill Pettway, Ron Root, James Folkening, Paul Miller, Maureen Neal, Susan Cameron. Visitor: Sandra Dupuis, Ionia

James Jacob, Community College Liaison at Industrial Technology Institute welcomed the Task Force.

Meeting called to order by S. W. Cameron at 9:40. Dr. Cameron summarized the working paper and the tasks for subcommittees (see attached). M. Neal prepared the group to see a portion of the video on Tech Prep by Dale Parnell, president of AACJC when he visited Oakland Schools in February 3, 1988.

The subcommittees began working on their task after the video presentation and a short discussion.

The outcomes of the meeting were the following:

The Leadership subcommitee proposed the following definition for Tech Prep taking the definition on the attached work sheet and revising it to read:

> *Technical Preparation Programs are coordinated programs between local schools districts and community colleges. The intent of Technical Preparation programs is the adequate preparation of students at the secondary level and the community college level for employment in technical occupations or advanced training or education. To achieve this goal for student success, the local school-community college partnerships must focus on program planning articulation, and counseling services which ensure continuity of learning.*

Leadership also defined some issues or problem areas that need resolution:

1. Since high school registration is now occurring, winter semester may be the earliest that Tech Prep may be implemented.
2. Good articulation will be needed between levels.
3. Possible double/dipping community college/high school funding.
4. Define dollar limits per grant, number of proposals and models.
5. Decide now on next year State dollars needed.
6. Skills centers must fit into models.
7. How will we get governor/legislature involved to commit to this project. Develop strategy.

PRESENTATION OF MODELS/PROPOSALS

Use May Conference as Proposal Guidelines development conference.

Present tentative guidelines for proposals at May Conference.

Develop 4-5 Regional preproposal workshops - Month of June.

Press Release Statewide as early as possible.

Recommend that Features on Working Paper (attached) are unclear. Rework them.

COUNSELING/GUIDANCE ISSUES:

How will Tech Prep address the Adult Learner problems? EDP for adults must include family support. This is really focused on employability for adult learners. We should develop a dislocated worker model for Tech Prep. Link with Industrial/Union system and make contractual agreements with them for training.

Do we need to know more about the Michigan Opportunity Card for adult education? We have two type of program focus; one is adult. How will we meet this focus of Tech Prep?

Look from the student point of view for guidance activities. A student needs awareness of what is available and what he/she wants and values. In order to develop this awareness, the committee recommends high school/community college cooperation for a unified plan.

A large hurdle is who will do the guidance? One way to address this problem is to include the teachers in social studies and English.

Another way is to develop the Career Center concept in the schools. Some already exist.

Develop student awareness through the career cluster approach. (See EFE Project on the three courses in Information Technology, Bio-technology and Automated Manufacturing Technology).

Develop or search out videos on career for children at the younger ages of 8th grade.

Work on student self-awareness. Does student have ability, aptitude and motivation to reach his/her goals.

Involve parents early on in the process of student selection. Parents need as much information and the students. Parents are a big influence on career selection.

Who will teach the Tech Prep curriculum? Technology Education. Look to Industrial Arts teachers and to science teachers in the Middle Schools.

Get MEA to endorse concept of Tech Prep.

Guidance committee decided to take the key elements they had prepared at their last subcommittee meeting and fill in activities for each elements and present these at the next meeting. A subcommittee meeting was set for March 25 at Webers Inn to review these activities.

TECH PREP TASK FORCE AGENDA
APRIL 14-15

THURSDAY

9:30 ***Welcome*** - James Folkening, Community College Services Unit, Department of Education

Introductions

9:40 ***Agenda Review And Outcomes***

9:50 ***Summary To-Date*** - Denise Sigworth

10:10 ***Discussion of Definition of Tech Prep*** - Betty Brunelle, Assistant District Director, Instruction, Moraine Park Technical College, Facilitator

10:30 ***Coffee***

10:45 ***Tech Prep Models***

11:45 ***Subcommittee Charges***

12:00 ***Lunch***

Luncheon Speaker - Ms. Paula Stark, Department of Commerce

1:30 ***Continue in Subcommittee Meetings***

3:45 ***Break***

4:00 ***Whole Group Meeting*** - Progress Reports and Summaries

Discussion of May Conference

5:00 ***Cash Bar***

6:00 ***Dinner***

Remarks - Lola Jackson, Director of Vocational Technical Education Services

Presentations: Montcalm and Ionia Schools
Sandra Dupree

Norm Ashcraft and Ned Sutherland
Southwestern and Dowagiac Schools

Irv Cumming and panel
Education for Employment

FRIDAY

8:00 am ***Continental Breakfast at Delta College*** - Hosted by Nancy Drummond

TECH PREP TASK FORCE MEETING MINUTES
BAY VALLEY APRIL 14-15

The meeting was opened by Susan Cameron, Tech Prep Project Director, as she welcomed the task force. She notified the group of the May 19-20 conference. The task force members will be expected to attend. There will be a mailing for members to designate if they will be attending the conference. If was noted that Thursday will be the key day, so if the task force member could only attend one day, that day should be Thursday. Overnight arrangements should be made at the Holidome in Livonia.

The days events were explained as follows:

1. Denise Sigworth will give a summary-to-date and discuss the Tech Prep definition.

2. Betty Brunelle, Assistant District Director, Instruction, Moraine Park Technical College, Facilitator will discuss the Tech Prep definition.

3. The Tech Prep models will be discussed.

4. Subcommittee meetings will convene before lunch.

5. The Luncheon speaker will be Ms. Paula Stark with the Department of Commerce.

6. The Subcommittee will continue to meet after lunch until 4:00 p.m.

7. Whole Group will meet and give progress reports.

8. Cash bar at 5:00 p.m. and dinner at 6:00 p.m.

9. Dinner will be followed by evening presenters: Sandra Dupuis with Montcalm and Ionia Schools, Norm Ashcraft and Ned Sutherland with Southwestern and Dowagiac Schools, and Irv Cumming and panel, Education for Employment, Kalamazoo County.

The Friday schedule would start off with a continental breakfast at Delta College from 8:00 - 9:00 a.m. hosted by Nancy Drummond. The meeting would start off with recommendations for the State Board of Education in the areas of Leadership, Curriculum, and Counseling.

Goals to keep in mind were:

1. Telling State Board of Education what we are recommending in the general report.

2. Summarize what the subcommittees are doing and come to a consensus on the Tech Prep definition.

TECH PREP TASK FORCE MEETING
BAY VALLEY, APRIL 15

FRIDAY, DELTA COLLEGE

Leadership Subcommittee

The Leadership Subcommittee opened with their revised recommendations. The first was not changed as it was the State's terminology. The second recommendation was changed to eliminate the time frame. The third recommendation was modified to include the fourth recommendation and to have the funding listed for only one year 1988-89. Key factors were evaluated of the system and national involvement. Revised recommendations are attached.

The RFP Guidelines were discussed and agreed upon to include the following: diversity of technology, diversity of resources, priority points for business/industry involvement, priority points for people who have already made a commitment, points for a plan for preparing students to enter, Tech Prep, try for 16 demonstration projects $8,000 to $12,000 each, and other funding support and redirection of existing assets (JTPA).

Curriculum Subcommittee

The Curriculum Subcommittee felt is was important to remember the adult component. They agreed not to propose one model, to leave the description wide open to accommodate th local needs that may be other than health, business, and technical (i.e. agriculture).

Technical vs. Technology Education was addressed. Technology Education is what is referred to and technical specializations. The document that Dr. Mildred Krnacik had prepared was discussed. The Curriculum Subcommittee felt it could be very helpful, it is to be edited and will include comments from other committee members.

Counseling Subcommittee:

The Counseling Subcommittee had the following suggestions. Who gets involved with counseling teams for high school and community college projects—just about everybody, parents, teachers, business/ industry, teachers, etc..

The subcommittee went over the rough draft listing of the functions necessary on the Guidance; program and broke down activities or services that should be provided. The counseling/student ratio was discussed by the task force. It was agreed that the state has a limited number of counselors. To overcome this disadvantage it was suggested to have a planning seminar to include faculty to give them an overview of Tech Prep and list their help. There also needs to be coordination between high school and community college staff. Perhaps teachers of certain courses could become advisors. The task force was concerned about the counseling shortage and looked at other alternatives. Delaware addressed the problem by adding counselors on staff to help with their Tech Prep programs. Possibly use SCOPE people, retirees of the business community. The Career Education Commission was suggested, and the group was told they already have recommendations from this commission.

The meeting adjourned at 11:40 a.m.

Denise Sigworth
Director of Grants and Institutional Research

Topic: Summary-to-Date and Definition

Ms. Sigworth had several overheads to show the task force with the following information.

Task Force Mission: to provide for the development of models for the Tech Prep concept in Michigan.

Charge of the Task Force: 1) research state and national models, 2) review competencies, 3) identify guidance components, 4) determine academic areas, and 5) recommend delivery systems. The Curriculum subcommittee is focusing on the competencies. The Counseling subcommittee has been working on identifying guidance components to help make students aware of options. Ms. Sigworth suggested the delivery systems may differ from district to district resulting in many options.

Ms. Betty Brunelle
Assistant District Director, Instruction
Moraine Park Technical College

Topic: Tech Prep Definition

Ms. Brunelle told the group that in Wisconsin there is not much income for the high schools to provide vocational education let alone to do Tech Prep. Wisconsin is not comfortable with the community college system. Ms. Brunelle feels that the planning stages are essential, their version of Tech Prep is shortened. They do a lot of funding projects. Tech Prep curriculum used by six area high schools has been carefully modified so it is for the 15 and 16 year old who may not come with a lot of life experience.

The reason why you have to tell everyone what Tech Prep means is because it can mean totally different things to two different people. It has to stimulate interest, it has to give some idea of formation of what is to come.

Ms. Brunelle asked the group if they did not have the background that they did, would this definition be all that you would need to get started? Is it complete, is it clear? Are there any gaps?

The prerequisite skills were addressed in connection with the definition.

The task force felt that they need to consider who the audience will be and address the definition to them.

It was noted that it is truly more than cooperation of the coordination/articulation of Tech Prep. Right now students go to high school and to community colleges. We need to make each build on each other to get more mileage out of it. Basically the right hand not knowing what the left had is doing. It was suggested to add communication to the definition.

It was suggested that the key is the preparation of students. The main focus is preparation not outcome, as outcome will take care of itself.

The suggestion was made to change the term preparation in the first sentence of the definition to education (adequate education). It was decided that the subcommittees would address the definition on their agendas and the results would be discussed at 4:00 p.m.

Dr. Susan Cameron
Tech Prep Project Manager
Schoolcraft College

Topic: Tech Prep Models

Dr. Cameron discussed with the group the importance of business involvement, it will be one of the major components. The early two years are high school competencies, then the student would learn more advanced skills at the community college level.

The Matrix for Partnerships Programs Coordinated Curriculum Models was shown on an overhead. Models were from: 1) Chemeketa Community College, Oregon, 2) Kansas City Metro Schools, 3) Middle College HS/La Guardia, New York, and 4) Virginia Peninsula T. Nelson Community College, Virginia.

An overhead was shown on the organizational chart for the Virginia Peninsula Project. Again, it was noted how important business and industry are, they were also on the organizational chart.

The Oakland County Tech Prep Program outline was shown outlining the chain of command. It was suggested to define the end level as it relates to job placement. The point as to go on to a four year program, and that Tech Prep would not discourage students from doing this.

It was noted that the Oklahoma City project is a phase-in model. Oklahoma offers their vocational courses at the community college and at the vocational center.

Middle College High School is on the LaGuardia, New York campus. Their unique program was discussed briefly. The target population is a group that does have a need to be employed. They need to be placed in jobs that relate to their technical field of study, not unrelated jobs. Perhaps this would help to let the student know there are jobs out of school for them.

The charges of the subcommittees were discussed. The meeting ended at 12:00 p.m. for lunch.

The task force reconvened at 4:00 p.m. The Leadership subcommittee related their progress. They had discussed the definition, a proposed plan of action, involvement of big business and industry recommendations, and how to test market and prototypes. The definition the Leadership subcommittee arrived at is as follows:

> "The Tech Prep project is an educational subsystem within the senior high school and community college programs available for students with the proper interest and capabilities in math, communication and sciences which will lead to an associates degree or employment in specific technical occupations, advanced training or additional education. An adult component of this would require proper evaluation and preparation. The technical area of expertise will control the prerequisites for the technical program."

Suggestions were made, and it was agreed upon to discuss the definition during the Friday morning meeting session.

Meeting adjourned at 5:10 p.m.

APPENDIX G

Letter to Community College Board Memebers

May 9, 1988

State Board for Public Community & Junior Colleges
Lansing, Michigan

Dear Community College Board Member:

The attached executive summary outlines the major components of the final report which will be distributed to the State Board of Education at their June meeting. The report itself focuses on the outcomes of several meetings since December with the 23-member State Board appointed Task Force. I think it is important that we focus that report on their recommendations for the future of Tech Prep.

I also think it is important that we, as the grantee, point out some other important issues which have surfaced during the last few months.

First, because we believe Tech Prep is an extremely worthwhile project, we need to reiterate that the greatest potential of Tech Prep is that it will encourage those students who are not "college bound" to explore their options, prepare themselves with basic life competencies for learning, and decide about career goals and aspirations. Once students make a commitment, it is the responsibility of the educational system to provide a cohesive and well-planned curriculum. From the community college perspective we think that providing a structure for curriculum planning will allow both the high schools and community colleges to take a serious look at how we deliver educational services and how we might improve that.

We also think that for Tech Prep to succeed we need to look at the greatest obstacles that lay in the way of future plans. The most difficult tasks for Tech Prep to overcome are two very pragmatic and negative points of view. One is that Tech Prep is a reincarnation of the articulation project. A subset of this problem is the philosophical argument that Tech Prep should not be an associate degree program. We contend that without the goal of the completion of a recognized degree that the community colleges have little to contribute to the curriculum process. However, if Tech Prep is developed correctly it will be a coordinated curriculum which will prepare students to become "master technicians" with skills that equip them to deal with new and rapidly changing technologies.

The second obstacle is the concern of vocational educators that Tech Prep will diminish their enrollment at the secondary level. We can't promise that this won't happen. What we would like to see happen is that vocational education is a partner in curriculum planning and support. If over 50% of the students are currently enrolled in the general education track, then there certainly must be cooperative programs between higher education and vocational education that can encourage these students to elect a preparatory track which focuses on job training. In fact, most national models are based upon a planned curriculum with vocational education at the secondary level and occupational education at the community college level.

However, many forces are at work outside of the discussions of the Task Force itself. If we fail to focus our attention on how we can work together to improve vocational/occupational education, we'll fail to realize the potential of our already "neglected majority".

Your continued support in resolving these issues is of the utmost importance. We hope that through the remainder of this grant that with your support, we can resolve some of these issues.

Sincerely,

Louis A. Reibling
Dean of Instruction, Schoolcraft College

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